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SPONTANEOUS LANGUAGE SAMPLING IN

FIVE AND SEVEN YEAR OLD BOYS

BY

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ABSTRACT

The question posed in this study is whether linguistic complexity differs with language function. Instructions and stimulus materials were developed to tap the personal, the representational-imaginative and the heuristic functions of language.

A sample of eighteen normal five year old boys and twenty normal seven year old boys was selected from one middle to lower middle class Edmonton school district. Oral language samples were elicited from each subject using tasks and materials designed to serve representational-imaginative, personal, and heuristic functions of language. Language samples were then segmented and mean length of utterance and Developmental Sentence Score (Lee, 1974) procedures applied to twenty C-units and seventeen to twenty sentences respectively. Analysis of variance and chi square were used in comparing the data collected. It was necessary to study the heuristic language in a manner different from the above.

Results support the postulation that language complexity does differ with function. For measures of overall linguistic complexity, statistically significant differences exist between scores of the five and seven year old groups and between scores of the representational-imaginative and personal tasks. The seven year old group scored significantly higher than the five year olds and for both groups, scores on the personal

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Results support the postulation that language complexity does differ with function. For measures of overall linguistic complexity, statistically significant differences exist between scores of the five and seven year old groups and between scores of the representational-imaginative and personal tasks. The seven year old group scored significantly higher than the five year olds and for both groups, scores on the personal

task were significantly higher than on the representational-
imaginative task. For the five year old group there is
insufficient data in the heuristic task to support any con-
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The observed differences between language collected in
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CHAPTER I

THE PROBLEM

Does a child's level of language complexity differ with
the function of his language? In order to answer this ques-
tion, some discussion of language development, and of language
itself, becomes necessary. When a child is born he enters
not only a physical setting but also a man-made symbolic
setting of which language is a part. For the infant, however,
the relationship between object and symbol is flexible and
lacks order until he "discovers and recreates" (Schmidt, 1973,
65) the symbol system for himself. As the child gives meaning
to his experiences by investing them with symbols, he is mas-
tering language. When his symbols have common meanings and
can therefore be shared with others in his environment, the
child's language system takes on communicative value. Lang-
uage is not limited to mere words, however.

M. A. K. Halliday, a British linguist, approaches the
study of language with regard to the purposes it serves, how
these purposes are achieved, and how language form is affected
by the functions it performs (1973). In language development,
consequently, the child is seen as mastering a limited set of
basic language functions, or uses of language. More specifi-
cally, as he gives meaning to his experiences and invests them
with symbols the child recognizes and builds upon the multi-
functional nature of language. His complexity of language is

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expected, therefore, to vary with the function.

In order to study children's language, in both clini-
cal and research settings, collection of a sample of "spon-
taneous" language is recommended. This sample is typically
collected in a situation where the child converses with one
adult. A nonstandard variety of materials and instructions
is used in order to stimulate conversation. Collection of
the language sample in this manner necessitates the child's
use of a variety of language functions during the conver-
sations. Longhurst and Schrandt, in discussing language
sample collection, have stated:

> We know very little about the elicitation variables
> that may influence the quantity or quality of the
> language sample obtained. Variables, such as the
> examiner, stimulus materials, instructions and
> elicitation situation need to be investigated.
> (1973, 248)

Following the necessity for research in this area, the
purposes of the present study are fourfold. One purpose is
to design instructions and stimulus materials to tap differ-
ent language functions: personal, heuristic and represen-
tational-imaginative. These are modifications of Halliday's
multi-functional language system (1969, 1973) to be discussed
in the chapter reviewing pertinent literature. A second
purpose is to determine whether differences in complexity
exist between the language samples collected for each of per-
sonal and representational-imaginative functions of language.
Another purpose of the present study is to determine the
nature of these differences among normal five and seven year

olds. The final purpose is to determine the presence of differences in heuristic language between normal five and seven year olds and to describe the nature of these differences.

As an indirect offshoot of the present study, practical application may be made to the assessment of language abilities of children with language disorders. This applies specifically to clinical assessment involving collection of children's language samples, and more specifically to ensuring representativeness of the samples themselves.

This study involves a group of eighteen normal five year old boys and a group of twenty normal seven year old boys as subjects. A language sample was collected from each subject in three tasks respectively representing the personal function, the heuristic function and representational-imaginative function of language (Halliday, 1969, 1973). Samples of language were then analyzed according to mean length of utterance and Developmental Sentence Score (Lee, 1974), both measures of language complexity. Analysis of variance and chi-square were used in comparing the data collected.

In the next chapter review of literature is discussed. Because of methodological obstacles, a review of methodological literature is included in chapter three. Chapter four describes the methodology. In chapter five, results are reported and further discussion of the overall problem is in chapter six.

CHAPTER II

REVIEW OF LITERATURE

Language is multifunctional. Authors in various branches
of linguistics and education have discussed this position.
Halliday words his statement on multifunctionality of chil-
dren's language as follows:

> The child knows what language is because he knows
> what language does . . . Language in all these
> uses has come within his own direct experience,
> and because of this he is subconsciously aware that
> language has many functions that affect him per-
> sonally. Language is, for the child, a rich and
> adaptable instrument for the realization of his
> intentions, there is hardly any limit to what he
> can do with it (1973, 10).

From her survey of literature in what she has called "devel-
opmental sociolinguistics", Cazden (1972b) like Halliday (1973)
considers the child as having varieties of language which
are functionally differentiated. The bases of the child's
choices among these language varieties are situational char-
acteristics as perceived by the child based on his experience
(Cazden, 1972b; Gumperz, 1971), motive or purpose (Hymes, 1972;
Gumperz, 1971) and familiarity with the audience and its
social identity (Gumperz, 1971). The very fact that socio-
linguists have recognized varieties of language and factors
influencing the choice of a given variety in a situation,
supports the fact that language has many functions.

This position derives further strength from practical
approaches to language in both teaching programs and curric-

ulum design. Gleason (1972) studies the descriptions given by one child to a second child who was unable to view the provided stimulus picture. The children were divided into two groups and one group given training in description. Results indicated a significant difference between the control group and the experimental group. In discussing the results Gleason states:

> . . . what we must have done was to indicate to them which of a variety of descriptive styles they had the potential of producing was the one we wanted them to use; and in our training sessions we facilitated their use of that style. (1972, 106)

This approach implies that language consists of multiple styles related to function.

Cazden (1972a) describes an educational program in infant and junior schools in which three aspects of children's language performance are stressed. The first two aspects are attention and auditory discrimination, and language structure and vocabulary. The third aspect, explicit language use, lends further practical support to approaching children's language as having many purposes. The children are taught various language uses through specific communication tasks; for example, in emphasizing the instructional mode and the heuristic mode, one child must give instructions while the second child is required to ask questions about the instructions.

Joan Tough (1973a & b) considers the necessity of providing a nursery school environment in which the use of lang-

uage in many functions is fostered. Redirecting the focus
of the child's attention requires creating and placing the
child in situations which facilitate using his language to
represent, anticipate, predict, plan, explain, analyze and
search for meaning and interpretation (Tough, 1973a, 22).

Chui (1972) studied register characteristics of admin-
istrative memos as a prerequisite to preparing advanced
level English programs for second language learners. Like
the practical approach to children's language, discussed
above, Chui's approach is also supportive of viewing language
as useful in multiple functions.

One final source of strength for the position that lang-
uage is multifunctional is drawn from literature suggesting
categorization systems for language output based on function.
Piaget (1926), Britton (1971) and Tough (1973a) have devised
systems for categorization of children's language based on
language purpose in social interaction. Both Skinner's (1957)
and Ervin-Tripp's (1972) classification systems are based on
the direct effect produced by the utterance in social con-
text. Joos (1967) and Hymes (1972) describe adult language
as a range of styles evoked by language usage situations.
Halliday himself has proposed a system of seven models of
language function which are assumed to be within the five
year old's repertoire (1969, 1973). In summary, the position
that language is, in fact, multifunctional is supported by
theoretical statements, by practical approaches to language

learning and by theoretically devised language categorization
systems.

Of the categorization systems discussed above, Halliday's
(1969, 1973) was chosen as basic to the present study and will
be described further. The simplest and first evolved lang-
uage function or language model of Halliday's seven model
categorization system is termed "instrumental". Here the
child is aware that language is used as a means of assuring
action and in the satisfaction of material wants and needs.
In the "regulatory" model of language the child is aware that
language enables him to control others and others to control
him. This model is the basis of the language of instructions
and rules. The third language model is "interactional" where-
in language mediates personal relations.

> Language is used to define and consolidate the
> group, to include and to exclude, showing who
> is 'one of us' and who is not; to impose status,
> and to contest status that is imposed; and humour,
> ridicule, deception, persuasion, all the forensic
> and theatrical arts of language are brought into
> play (Halliday, 1973, 14).

In the "personal" model of language, the child is aware of
language as something characteristically and specifically his
own. This model plays a role in personality development in
addition to providing for the expression of feelings and
attitudes which make public the child's individuality. The
"heuristic" model of language enables the child to question
and explore reality. Here, the child is aware of language as
a means of investigating his environment. The sixth and

seventh models of language are those most likely to be tapped in a clinical language assessment involving collection of a "spontaneous" language sample. In the "imaginative" model, the child is aware of language as enabling him to create his own reality. Poems, riddles and rhymes are products of the "imaginative" model where the meaning of what is said is not primarily a matter of context. In stories and drama, the "imaginative" function of language is based on context. The final model, the "representational" model of language is also one of the latest developments. Here the child is aware of language as a means for relating the specifics of his real-world experiences.

Halliday's seven models of language (1969, 1973) have been discussed by Wilkinson (1971) who summarizes by stating that even Non-Linguistic Man is in some sense aware of all seven models. Wilkinson (1971) considers, therefore, that the probability is high that all children except the severely disadvantaged are also aware of all seven models in some fashion. Joan Tough (1973a) also comments on Halliday's (1973) functional approach. Tough (1973a) directs her own study at what the child achieves by using language, at what range of meaning the child attaches to his experiences and at the dependence of kinds of expressions on syntactic structures. She, therefore, contends that a classification must be able to accommodate data by differentiating the language functions on some criteria depending on communicative intent rather than

on linguistic structure. Although she recognizes the use
of Halliday's (1973) approach, she finds the following a
major flaw in its usefulness as an analytical tool:

> The functions are realized in the grammatical
> structure of the child's language (Halliday
> forthcoming). So the uses of language which
> are identified (the instrumental, the regu-
> lative, the interactional, the personal, the
> heuristic, the imaginative and the representa-
> tional or informative) form a classification
> which is based on the recognition of syntactic
> structures (Halliday 1973).
>   (Tough, 1973a, 8)

This criticism seems to be somewhat unfounded. The fact
that a child chooses a syntactic structure in order to
express a language function is not necessarily evidence of
the classification system itself being based on syntactic
structures. In fact, it is the purpose of the present study
to determine what syntactic structures differentiate one
language function from another. In this sense, Halliday's
(1969, 1973) basic seven-model system appears useful here.

Empirical studies based on Halliday's (1969, 1973)
multifunctional system are rare. Wilkinson (1971) reports
analyzing the language of the same girl at age three years
and again at eleven years using Halliday's (1969, 1973)
models. Results indicate that the girl had awareness of
all seven models at both ages but was not as capable in
describing and defining at three as she was at eleven.
Such an experiment on one subject is admittedly questionable
evidence supporting use of Halliday's (1969, 1973) classi-
fication.

As with empirical support for use of Halliday's (1969, 1973) system, practical support based directly on Halliday's seven-model system of language is also limited. Elementary Language Arts Handbook (1973, 42-50) describes Halliday's (1969, 1973) theory and classification and goes on to make specific program suggestions to teachers for each model of language. McFetridge (1972) likewise exemplifies Halliday's (1969) categories for use in classroom language-arts lessons.

In summary, Halliday's (1969, 1973) conceptualization of language multifunctionality as depicted in his classification system is considered suitable for the present study. The limited literature either supporting or criticizing Halliday's (1969, 1973) work must be considered. As he applied it to his own classification, Piaget's comment must also be applied to Halliday's (1969, 1973) classification: "This classification LIKE ANY OTHER is open to the charge of artificiality" (1926, 11), (author's emphasis). The conception that language is multifunctional is, nevertheless, well founded.

In addition to the position that language serves many purposes, the position that language structure differs with language function must also be discussed. As well as describing a seven-model system of language, Halliday (1973, 20) considers each language function as reflected in the nature of the grammatical organization of the language itself. Certain types of syntax and vocabulary are primarily assoc-

iated with certain of the seven language functions.

> The language system of the very young child is,
> effectively, a set of restricted language varie-
> ties and it is characteristic of young children's
> language that its internal form reflects rather
> directly the function that is being used to serve.
> What the child does with language tends to deter-
> mine this structure (Halliday, 1973, 27).

In early writings (Halliday, McIntosh and Strevens,
1964), it is proposed that language varies along with func-
tion: the variety of a language distinguished by function
is named "register". Where dialects are seen to differ
primarily in the actual sounds and production of speech,
registers are described as differing primarily in grammar,
namely syntax and vocabulary, although some registers present
distinctive features at other levels including voice quality.
While highlighting the differences between registers in syn-
tax and vocabulary, Halliday, McIntosh and Strevens (1964)
contend that a great deal of grammatical material is, in
fact, common to many of the registers.

Halliday's (1969, 1973) seven models of language, dis-
cussed above, are each present in the early stages of lang-
uage development and later become systematized in the child's
grammar. The child theoretically selects language for a
given situation so that a particular function is served by
grammatical features: "For the child, all language is doing
something: in other words, it has meanings" Halliday, 1973,
18). Halliday (1973) characterizes this meaning in language
as serving a social function in the life of the child. The

social function determines both the options which the child may create for himself and their realization in structure. This relation between function and structure of language is seen as an important feature of language as a whole:

> The internal organization of natural language can best be explained in the light of the social functions which language has evolved to serve. Language is as it is because of what it has to do. Only, the relation between the language function and the language structure will appear less directly, and in more complex ways, in the fully developed adult system than in children's language (Halliday, 1973, 34).

Among sociolinguists, Hymes' (1972) viewpoint is in close alignment with Halliday's (1973) in regard to linguistic form varying with language function. All linguistic features are seen as having the possibility of participating in all language functions. In direct instances, however, given linguistic forms may be primarily associated with each function. Gumperz and Hymes (1972) similarly state that there is a co-occurrence of speech styles across language functions but there is also a contrastive choice among styles for each function.

Basil Bernstein (1971) supports Halliday (1973) in regarding the seven language models as distinct functions realized differentially in the grammatical system and the vocabulary. In his study of elaborated and restricted speech codes Bernstein (1971) expresses the central theme that "the form of the social relationship acts selectively upon the meanings to be realized, which in turn activate specific

grammatical and lexical choices" (1971, 14). In addition
to the social setting, Bernstein (1971, 26) also considers
the communicative intent as related to language structure.
Both of the above statements take into account the distinc-
tion between speech registers as the surface structure
observed in relation to specific social contexts and communi-
cative purposes, and speech code as the deep structure regu-
lating speech patterns in diverse social settings. This
distinction is important in that the position of the present
study is viewed in terms of register or surface structure.
Bearing the above distinction in mind, and considering the
statements of Halliday (1973), Hymes (1972) and Bernstein
(1971), the position that language complexity differs with
language function is given some theoretical support.

Experimental support for the position that language
complexity varies with language function is not extensive.
However, two authors report studies on children's language
as related to the situation in which it was collected. Using
a variety of pictured stimuli, different examiners and varying
situations, Cowan (1967) reported that children's language
differed in mean length of response depending on the situation,
the examiner and the stimuli. This evidence is in direct con-
trast to that reported by Young (1941). Nevertheless, Young's
(1941) study suffers from methodological drawbacks, such as
nonstandardization of stimuli, instructions or situations.

The importance of situation as an elicitation variable

is recognized by Menyuk (1963), Strang and Hocker (1965) and Lee and Canter (1971) all of whom report collecting language samples in varying situations. These studies, however, involved adding the data per subject rather than the data per language-using situation and studying the contrasts and comparisons among situations.

Despite dangers inherent in making direct comparisons between studies, two such comparisons appear to shed some light on the position that language complexity varies with language function. Strang and Hocker (1965) compared the results of their study with those of Strickland's (1962) study of oral language of elementary school children. They concluded that children do, in fact, use different language in different situations of language use. Strang and Hocker state in addition:

> Study and analysis of the situations in which each sample occurred (parties, Sunday School, outdoor play, trips, at the movies, in the home, and in a first-grade class of a public school) definitely showed that the child's language patterns are influenced by the situation in which he is speaking. Sentence length was also affected by the given situation. (1965, 39)

A similar conclusion may be drawn in making a second comparison between results of two studies. The mean length of utterance obtained by O'Donnell et al (1967) is compared with that obtained by Loban (1963). O'Donnell et al (1967) required each child to tell a story after viewing a film: Loban (1963) asked each subject what he saw in each of six pictures and what he thought about each one. The subjects'

language output, in terms of length of utterance, appeared
to differ between the two tasks. This, too strengthens the
position that language complexity varies with language
function.

In addition to implications made by comparisons between
studies, results of individual studies also lend credance to
viewing language complexity as differing with language use.
Tough (1973a) studies children's language collected in a
semi-structured play session with a friend. One task included
was story-telling. A significant difference between this
task and the other tasks was noted for one group in the mean
length of utterance. Tough suggests that "the demands of
the task influence the form of the utterances the child will
use" (1973a, 14). Similarly, in discussing the short, simple
utterances elicited by questions about a picture, Tough
(1973a) suggests that the child chooses the language as
appropriate for the purpose. She states:

> The advantaged three year-old and the five-year-old
> children are not talking in order to produce nouns
> and adjectives, verbs and complex utterances. They
> are doing just the reverse, they are employing lang-
> uage to achieve particular ends or effects and since
> they must use words to do it, they draw on their
> language resources to serve the particular purposes
> they seek to fulfil (Tough, 1973a, 12).

In discussing a study by Labov et al (1968) on the non-
standard English of Negro and Peurto Rican speakers in New
York City, Cazden (1972b) suggests that greater emotion or
greater personal involvement in the topic of conversation is
related to greater complexity in language output. Examples

given were the difference between the simple narrative structure observed in a report of a T.V. show and the complex explanation of a personal fight (Cazden, 1972b, 208).

In an unpublished study by Wilkinson and Stratta at University of Birmingham (Wilkinson, 1971, 118) subjects were asked to give a commentary and then to report on a television excerpt. Results were similar to those reported by Tough (1974a) and Cazden (1972b, 208). On a modified index of subordination, scores were much higher in reporting on the television excerpt than in delivering a commentary.

Koenigsknecht (1974) in validating Lee and Canter's Developmental Sentence Scoring (1971) selected ten pre-school children. He obtained four language samples from each subject over a two-week period and two-additional samples at subsequent four-month intervals. Materials were of two types: action pictures and the story of "The Three Bears". No significant differences were obtained for stimulus-material effects upon the over-all developmental sentence scores. However, four individual grammatical categories showed significant changes with different materials. There were: Indefinite Pronouns, Personal Pronouns, Secondary Verbs, and Interrogative Reversals.

In the four individual studies discussed directly above, results lend support to the position that language complexity differs with language function. Although her thesis was not designed as a contribution to the study of language function

Yorke's (1973) study of twenty-five four and five year olds also yields considerable support when closer attention is given to her direct results. Language samples were collected in three tasks:

1. The individual subject made up and told a story about a picture which he selected, to his four peers in the presence of the examiner.

2. Individual subjects asked questions about an unfamiliar object.

3. Individual subjects talked with an older sibling on the topic or topics of their choice.

Results are tabulated below for the age group, 5 years 3 months to 5 years 5 months.

Table 1

Comparison Across Language-Using Situations

	Situation		
Measure	1	2	3
Mean number of words	38.7	19.2	40.5
Mean number of C-units	4.4	3.4	5.0
Mean number of mazes	2.8	2.0	1.0
Mean length of mazes (words)	2.7	3.0	3.5
Mean number of partials	0.0	1.0	4.8
Mean length of partials (words)	0.0	3.0	3.4
Mean length of C-units	7.2	4.8	4.8

The results of Yorke's (1973) study appear to indicate a

difference in length and complexity of language collected
in the three language-using situations. These results,
consequently, support the contention that differences
exist in language complexity among the varying functions
of language. More explicit discussion of some of the
empirical studies will be found in the section on metho-
dology.

In summary, the position of the present study draws
heavily on the writings of Halliday (1969, 1973) and
embraces two major views. Firstly, language is multi-
functional. Secondly, language complexity differs with
language function.

CHAPTER III

REVIEW OF METHODOLOGICAL LITERATURE

Because of the nature of the initial purpose of the present study, namely to design instructions and stimulus materials to tap three different language functions, a section of literature review regarding methodology will be included in this chapter. Also included will be a discussion of the various stages of informal pilot study.

The first decision made in this study was that of employing only boys as subjects. Studies of children's language involving collection of a "spontaneous" language sample have generally included both boys and girls as subjects for the study (See Appendices A through E). Cherry (1975) reviews empirical studies of sex differences in preschool children's spontaneous speech at the levels of phonology, syntax, semantics and conversational usage. McCarthy (1930) reports differences between speech output of boys and girls. She suggests these differences represent differences in language development. Subsequent studies (Davis, 1937a; Day 1932; Templin, 1957; and Young, 1941) basically confirm these findings. Cherry (1975) comments that meaning of the findings is difficult to assess because of lack of statistical studies or statistical insignificance (Templin, 1957). Both Winitz (1959) and Menyuk (1963) report results countering the suggestion that sex differences

exist in children's language abilities. Conclusiveness
of the existence of differences between boys' and girls'
language ability has not been established. Cherry states:

> The question of sex differences in child speech
> remains an open one. The paucity of empirical
> studies in this area since the 1930's and 1940's
> should be an impetus for further research.
> (1975, 18)

Following the above, it was decided that in order to avoid
confounding variables, this study would include only boys
as subjects.

Despite the fact that the studies reviewed all involve
children as subjects, they vary greatly in the instructions,
materials and situations employed. Several of the studies
reviewed (Young, 1941; Menyuk, 1963; Strang and Hocker,
1965; Lee and Canter, 1971; and Yorke, 1973) recognise the
multifunctional character of children's language by includ-
ing more than one language-using situation in the collection
of the language samples. The major drawback in these
studies is the fact that analysis is not directed at inter-
functional differences in language performance. Also
notable is the fact that two of these studies (Young, 1941;
Strang and Hocker, 1965) while varying language using situ-
ations, do not structure or formalize either materials or
instructions. The above studies are discussed in Appendix A.

The remaining studies reviewed do not concern them-
selves with language function in either the collection or
the analysis of language samples. As a result of this lack

of concentration on language function, sampling techniques
are generally informal and unstructured in the early studies
(McCarthy, 1930; Day, 1932, and Davis, 1937). Studies by
Templin (1957) and Strickland (1962) are likewise informal
and unstructured in their sampling techniques. These
studies are described in Appendix B. Two studies described
in Appendix A (Young, 1941; Strang and Hocker, 1965) might
also be included here as using unstructured, informal
collection devices despite the fact that both use more than
one language sampling situation.

Although the following studies control both instructions
and materials, they are not concerned with language func-
tion. Five general types of language collection techniques
seem to be employed in these studies. Several studies
involve description and explanation related to pictures and
toys (Winitz, 1959; Loban, 1963; Cowan, 1967). Also
included in this group are the studies by Menyuk (1963) and
by Lee and Canter (1971) though they are discussed in
Appendix A. The above studies are described in Appendix C.

Several of the studies controlling materials and
instructions include story-telling (Minifie et al, 1963;
O'Donnell et al, 1967; Anderson, 1972; Hass and Wepman, 1973).
Studies by Lee and Canter (1971) and Yorke (1973) also
include story-telling and are described in Appendix A. The
above studies are described in Appendix D.

Two of the five types of language collection tech-

niques that are involved in the reviewed studies have limited instances of use. Role playing is used by Menyuk (1963) in sampling language. (See Appendix A.) Responses to specific questions are involved in samples collected by Menyuk (1963) and O'Donnell et al (1967). See Appendices A and D respectively, for description of the studies.

The final type of language collection technique to be discussed involves question asking. This technique is used by Yorke (1973) as part of her study and constitutes an entire study conducted by Robinson and Arnold (1972). Description of question asking studies follows in Appendix E.

Three of the five general types of language collection techniques are employed in the present study. One task, designed to tap the representational and imaginative function of language (Halliday, 1969, 1973) calls for both description and explanation of pictures and story-telling related to pictures (see Appendices C and D). A second task was designed to tap the personal function of language (Halliday, 1969, 1973). This task involves the same materials as Menyuk (1963) but attempts to elicit description of personal emotions in relation to experiences. The final task of the present study, designed to tap the heuristic function of language (Halliday, 1969, 1973) is modelled on the question-asking section of Yorke's study (1973) and on task 2 of Robinson and Arnold's study (1972). (See Appendix E.) Although the general type of instructions

and language collection technique were decided upon on
the basis of the review of studies presented above, the
selection of tasks specifically with respect to Halliday's
(1969, 1973) models of language function was largely based
on McFetridge (1972) and on the Elementary Language Arts
Handbook (1973).

In addition to viewing the literature on language
sample collection in terms of collection technique, conver-
sational setting may also be considered. Most studies in-
volve recording the child alone with the examiner conversing
with the child (McCarthy, 1930; Day, 1932; Davis, 1937a;
Templin, 1959; Winitz, 1959, Loban, 1963; Menyuk, 1963;
Minifie et al, 1963; O'Donnell, et al 1967; Cowan, 1967;
Lee and Canter, 1971; Anderson, 1972; Hass and Wepman, 1973;
Yorke, 1973). Some studies involve recording the child in
conversation with his peers (Young, 1941; Strickland, 1962;
Menyuk, 1963; Strang and Hocker, 1965; Yorke, 1973). One
study involves recording the child in conversation with
his mother (Robinson and Arnold, 1972).

The decision was made to collect language samples in
a conversational setting with an adult rather than in play
with other children. A primary consideration, in addition
to the support of most of the studies reviewed above, was
the amount of control possible over instructions and
materials. A structured situation was preferable in that
the language functions could be more clearly separated.

Since the possible application of the present findings is
to the assessment of children with delayed language devel-
opement, language disorders or low language ability, some
practical consideration was also taken in selecting the
language collection technique.   Lee and Canter state that:

> Adult interaction is especially important in a
> clinical setting since language-delayed children
> seldom engage in self talk and only intermittently
> talk with one another.   (1971, 319)

This would support the child-adult conversational setting.
Bernstein (1958) reports that children of lowest language
ability have access only to the "public" form of language.
Although children with higher language ability are able to
use "formal" language, they, too, use the "public" form
with peers and in informal situations.   Thus, a setting
less structured than the one selected and involving other
than child-adult conversation might not disclose differences
between children of high and low language ability.

In addition to the choice of the instructions and
materials and the conversational setting, it was also
necessary to determine the number of responses to be col-
lected and analyzed.

In the present study sixty utterances per subject are
analyzed but for each task only twenty utterances are
considered in group means.   The choice of sixty responses
is supported experimentally by Darley and Moll (1960) who
indicate that for fifty responses, the number most commonly
used in research, the reliability of mean length of response

scores (0.85) seems adequate for most purposes. Increasing the number of responses analyzed would improve the relia- bility of scores only slightly since the curve begins to plateau. Darley and Moll (1960) state in addition that the group means for five, ten, fifteen . . . fifty responses are small and that for a group of subjects the group mean would remain essentially the same, regardless of the number of results on which the scores are based. Thus twenty utterances per task is a justifiable number in calculating group means. One comment must be made, however, that the reliability discussed by Darley & Moll (1960) applies only to the particular type of language collection technique with which the research was concerned. Research did not include a variety of stimulus materials and instruction; nor was there an indication of the equivalence of the numbers of pictures required per subject in order to secure fifty utterances. Despite this drawback, both practicality and precedents in research (8 of the 18 studies reviewed) recommend the use of near fifty utterances.

Once a decision had been reached regarding the number of responses, it was necessary to define the response unit. The C-unit, or communication-unit, was chosen as the unit of response to be measured in this study although it has not been the basis of analysis in much of the literature reviewed. Nice (1925) interprets length of response as "sentence" but this is not defined. Templin (1957) considers an "utterance" as a unit of speech determined by the sub-

ject's natural break in verbalization. Loban's (1963)
"C-unit", the independent clause with any of its modifiers,
is identical to the "T-unit" or the means of response
division used by Hunt (1965) and by O'Donnell et al (1967).
Since the "C-unit" consists of one main clause and any of
its subordinate clauses, it preserves what O'Donnell et al
underline as the best indicators of maturation: "the use
of adverbial infinitives, sentence adverbials, co-ordin-
ations within T-units and modifications of nouns by adjec-
tives, participles, and prepositional phrases" (1967, 90).

Analysis of response units has generally involved some
measure of length and complexity. One measure of language
ability selected for the present study is mean length of
response (MLU). This measure has been subject to consid-
erable study. Nice concludes that "the average sentence
length may well be the most important single criterion for
judging a child's progress in the attainment of adult lang-
uage" (1925, 378). McCarthy calls mean length of response
"the simplest and most objective measure of the degree to
which children combine words at various ages" (1930, 50).
McCarthy (1930, 46) calculated the reliability of the
responses by correlating the odd with the even-numbered
responses with the resulting mean reliability coefficient
of 0.91. Minifie, Darley and Sherman (1963) studied the
temporal reliability of mean length of response along with
six other language measures. They conclude that the mean

length of response measure appears to be the most reliable of any of the measures.

In general the above findings support those of Davis (1937b) who compared mean sentence length of long and short sentences. Minifie, Darley and Sherman do, however, point out limitations as well:

> Any single mean obtained from a fifty response language sample, however, is only a gross estimate of the child's true mean length of response. The temporal reliability (measured by variability of speakers from day to day) of (a) the mean length of response and (b) the standard deviation of response length within a fifty-response unit are sufficiently large to place a given child as much as two years ahead or two years behind his age level; this is true even though he may be operating at about the average for his age level. (1963, 146)

The above limitations, although applicable to C-units, refer to sentence based measures of length. The C-unit, however, does not vary as greatly as the sentence and consequently is less affected by the limitations noted by Minifie, Darley and Sherman (1963, 146).

In a later study, Shriner and Sherman (1967) obtained speech samples of fifty responses from two-hundred children aged two and one-half years to twelve years in order to evaluate the relationships among the presently used expressive language measures. Their conclusion is that if a single measure is used for assessment of language development, mean length of utterance would be the most useful. Limitations are also noted by Shriner (1967). As age increases, mean length of utterance loses its significance

as a predictor of language development. Response length apparently approaches an asymptote for the older children and a more important role is assumed by factors such as those measured by sentence complexity scores.

In view of the need expressed above for a measure of linguistic complexity, the second measure used in the present study is the Developmental Sentence Score (DSS) (Lee, 1974) derived by Lee and Canter, 1971. This scoring procedure was developed in order to estimate the status and progress of children under going language therapy in a clinic. The procedure gives weighted scores to a developmental order of different parts of speech, and specific or syntactic constructions. Bloom (1967) criticizes Developmental Sentence Types (Lee, 1967) the forerunner of the Developmental Sentence Score (Lee and Canter, 1971). Instead of tracing the gradual emergence of phrase structure, Developmental Sentence Types (Lee, 1967) are seen as:

> Simply a pairing of traditional grammatical
> functions with groups of utterances reported
> in the literature, without regard to the func-
> tions of utterances as they occur. (Bloom,
> 1967, 295)

Longhurst and Schrandt (1973) compared four current linguistic analyses including DSS (Lee and Canter, 1971) with regard to the following criteria:

1) ease of application
2) interscorer reliability
3) ability to discriminate language differences
   between the two children aged 5.2 and 5.4 studied
4) ability to describe specifically the differences
   between the two children.

Lee and Canter's (1971) procedure was found to be the sim-
plest of the four procedures to apply. Interscorer relia-
bility was 79% and 82%. Some disagreement existed regarding
what constituted a sentence and not all of the utterances
were scorable. This latter concern seemed to indicate that
DSS (Lee and Canter, 1971) is at too high a level of linguis-
tic complexity for the children studied (5.2 and 5.4). Over-
all, this procedure tended to describe the subjects' per-
formance at a lower level than the other procedures. Despite
some of its drawbacks, this scoring procedure does supply
an index of complexity as well as a classification system
over and above the global score. For the purposes of the
present study, the combination of global score and clas-
sification system is appropriate.

Some of the problems encountered in scoring were answer-
ed by Lee (1974, 1975). As a result of research involving
200 normally developing children aged 2.0 to 6.11, the
developmental order of structures in each grammatical cate-
gory of DSS (1971) was verified. Weights were reassigned
to structures within each category in such a way that
grammatical growth could be compared across categories (Lee,
1974, 133).

The results of a series of investigations of the
validity and reliability of the DSS procedure and its re-
weighted scoring system strongly supports its use as an
objective measure of syntactic development (Koenigsknecht,

1974). The overall scoring procedure and each of its grammatical categories produced significant differences between age groups. This, along with the confirmation of grammatical hierarchies by reweighting procedures, indicates the validity of the DSS construct. Stability and accuracy of DSS scoring are reportedly enhanced by reweighting: overall estimate of reliability in terms of internal consistency is considered high, 0.73. The stability of DSS is evidenced by the results of studies of stimulus material differences, temporal reliability, sentence sequence effects and interviewing-clinician differences.

Lee (1974) recommends that DSS be calculated over fifty consecutive sentences. Because of the nature of the present study, the sentences selected are distributed over task instructions and materials and therefore not consecutive. In view of DSS reliability in a study of sentence sequence effects (Koenigsknecht, 1974), the lack of adherence to consecutive order is not considered a serious limitation. In that the total number of sentences is distributed over three tasks, only twenty sentences will be analysed per task. The support for using a reduced corpus of language is derived from a precedent set by Koenigsknecht (1974) who elicited only twenty-five sentences with both pictures and story material for his study. Lee states also:

> If a language sample should contain less than
> fifty sentences, a rather tentative DSS can still
> be derived by dividing the total sentence scores
> by whatever number of sentences is contained in
> the sample. (1974, 163)

DSS procedure is, therefore, applied with some adaptations concerning the corpus of language.

In summary, the choice of materials, instructions, conversational setting and devices for analysis of language output, was facilitated by some precedents set in literature. Further decisions, however, were based on an informal pilot study.

A pilot study of several stages was conducted in September and October, 1975. One objective was to select appropriate age groups for the study. Since the speech of the four-year olds of the pilot was found to be too unintelligible to avoid significant loss of data in transcription, ages five and seven years were chosen for the present study.

A second objective was to design instructions for each task. Several variations of instructions for personal, imaginative, representational and heuristic language were piloted with five and seven year olds. Instructions were validated through discussion with individual members of Language Curriculum and Instruction division of Elementary Education and through consideration of the actual language elicited by the instructions. The imaginative and representational tasks were found to be equivalent in terms of MLU and DSS (Lee, 1974) in the pilot data. Closer examination of the language collected showed stories being told when the subjects were asked to describe pictures, and conversely, description when they were asked to relate a story. In

both cases, the language was not considered clearly representative of either the imaginative or the representational model (Halliday, 1969, 1973). Consequently, the tasks were collapsed and instructions worded accordingly.

A further objective of the pilot study was to determine which stimulus materials would best suit the tasks. The materials were ultimately selected as a result of choices made by the pilot subjects themselves and by a panel of four judges from the Language Curriculum and Instruction division of Elementary Education. Actual language elicited in response to the materials was also a prime consideration.

The final objective of the pilot study was to develop a method of analysis for the data collected. The present guidelines for arriving at MLU were a combination of the methods of Loban (1963) and O'Donnell et al, (1965) with suggestions of Sampson (1976). The decision to use revised DSS (Lee, 1974) was aided by communication with Lee (1975). In the case of both measures, ease of applicability to the pilot data was a practical consideration.

Pilot data tabulated suggest the possibility of differences in scores obtained on the personal and representational-imaginative tasks. Data of the heuristic task suggested the need for an alternate method of analysis involving adaptation of DSS (Lee, 1974) and linguistic description.

CHAPTER   IV

METHODOLOGY

The research reported in this study was designed to
explore the possibility that language complexity might
differ with language function.   For the purpose of iden-
tifying significant differences if such existed, analysis
of variance and chi-square tests of relatedness were con-
ducted.   The following hypotheses guided the investigation:

1. The means for the five year old group and the
seven year old group differ significantly over the
five measures of overall linguistic complexity
chosen for examination.

2. The means for scores on the representational-
imaginative task and the personal task differ sig-
nificantly over the five measures of overall linguis-
tic complexity chosen for examination.

3. The means for the five year old group and the
seven year old group differ significantly over any
of the DSS component categories examined.

4. The means for scores on the representational-
imaginative task and the personal task differ
significantly over any of the DSS component cate-
gories examined.

5. The distributions of frequencies of possible
classes per DSS component category differ signifi-
cantly between the five year old group and the seven
year old group.

6. The distributions of frequencies of possible
classes per DSS component category differ signifi-
cantly between the representational-imaginative task
and the personal task.

7. The mean scores of the five year old group and
the seven year old group differ significantly in the
heuristic task for interrogative-reversals and wh-
questions.

8. The distributions of frequencies of possible
classes for interrogative-reversals and wh-questions
differ significantly between the five year old group
and the seven year old group.

The age groups, tasks, linguistic complexity scores and com-
ponent categories studies will be described further.

Subjects of the Study

The subjects of this study were kindergarten boys and
second grade boys drawn from two schools representing a
middle to low middle class area in the Edmonton Separate
School System. The kindergarten boys constituted all boys
of the two schools whose ages were four years nine months
to five years three months. The second grade boys were,
similarly, all boys of the two schools whose ages were six
years nine months to seven years three months.

Previous to the data collection, the decision was made
to automatically eliminate a child from the sample when the
following factors were determined to be present on the
basis of the teacher's information and judgment: subjects
with any indication of speech defect or for whom English
was a second language were eliminated because of the possi-
bility of confounding factors. These criteria resulted in
the elimination of two subjects, one from the kindergarten
of each school. Six other boys were eliminated from the
sample, two for taping problems, two who were not present
in school on any of the dates of testing, and two who gave
insufficient data for analysis.

The final sample consisted of thirty-eight boys dis-

tributed as follows: eight kindergarten boys and ten second grade boys from the first school, and ten kindergarten boys and ten second grade boys from the second school. The mean age of the kindergarten boys on the date of testing was 5 years 0 months. The mean age of the second grade boys on the date of testing was 6 years 11 months.

Instrumentation for Collection and Analysis of Language Samples

In order to secure the language samples for analysis, each of the thirty-eight subjects was interviewed individually and tape recorded in his school during November and December 1975, for approximately 20 minutes. Oral language was collected in response to three sets of materials and instructions designed to represent a personal, a representational-imaginative and a heuristic model of language following Halliday (1969, 1973). These are described below.

Language Collection

Materials for Representational-Imaginative Task:

The stimulus items were three large cardboard posters. One was a photograph entitled "Mother Fastens the Safety Belt" from the series One World/The Family (1B/14) produced by Fitzhenry and Whiteside (1971). The second and third posters were coloured pictures 1 and 3 of the Language Experience Reading Program Discussion Motivators produced by W. J. Gage (1970). These pictures pictured respectively a boy crying over a broken toy and a school yard scene

centering on two boys fighting.

Instructions for Representational-Imaginative Task:

All three pictures were presented together while the examiner explained:

> I have some Big pictures to show you. We're
> going to talk about all three of them. You
> pick the one you want to talk about first.

Once the child had chosen a poster, the others were removed and the examiner continued:

> Tell me all about this picture. Tell me what's
> happening. Make up a story.

A short pause was allowed before the child was encouraged to begin. When the child had made eight or more utterances, the poster was removed and the procedure repeated with the second, and then third poster beginning with, "You pick the one you want to talk about next."

Permissible Probes for Representational-Imaginative Task:

During the task, a select number of probes was allowed in encouraging the child Nothing more substantive than the following was permitted:

> (Tell me) what (else) is happening (in your your
> story/here/in this picture).

> (Tell me) what (else) (do) you see happening (here/
> in this picture/in your story).

> (Tell me) what (else) happened (here/in this picture/
> in your story) (before this/next).

> (Tell me) what (else) (do) you think happened(here/
> in this picture/in your story) (next/before this).

> Tell me (more/all/some more) (about it/about this
> picture/about your story).

<u>Materials for Personal Task</u>:

Four of <u>The Blacky Pictures</u> (Blum, 1950) were used as
stimulus items for language collection. These were cartoon
II, Blacky with Mama's collar; cartoon VII, Blacky with a
toy dog; cartoon VIII, Blacky watching the rest of the
family; and cartoon X, Blacky having a dream.

<u>Instructions for Personal Task</u>:

Pictures were presented singly in the following order:
cartoon II, cartoon VIII, cartoon VII and cartoon X. With
the first picture the examiner explained:

> Here are some (more) pictures. These pictures
> show how the dog feels inside. How does this
> dog feel inside?

After the subject responded the examiner continued:

> Have you ever felt _____(subject's word)?
> Tell me about it.

With the remainder of the pictures the same instructions
were given beginning with, "How does this dog feel inside?"
Each picture was used until five or more utterances had
been collected.

<u>Permissible Probes for Personal Task</u>:

As in the previous task, select probes were allowed as
encouragement. Nothing more substantive than the following
were permitted:

> (Tell me) what (else) (do) you do when you feel
> _____ (subject's word).

> (Tell me) what (else) makes you feel _____
> (subject's word).

(Tell me) how (else) you feel/felt inside.

(Tell me) how (else) (does) it make you feel.

(Tell me) when (did) you feel/felt _____
(subject's word.)

Tell me (more/some more/all) (about it/about
when you feel _____ (subject's word).

In the event that the child said he had not ever felt
like the dog in the picture, the examiner asked "Do you
know anyone who felt like that? Tell me about it" and
continued as above.

Materials for Heuristic Task:

Stimulus materials included a meat thermometer, a lace
doily, a lipstick holder, a shoe insole and an oven handle.
A large cloth bag was used to hold the materials.

Instructions for Heuristic Task:

The examiner presented the large cloth bag, shaking it
and saying:

I'll bet you're wondering what is in this bag.
You might know about some of the things in this
bag. Some of them might be new. Put your hand
in and quickly take out one thing.

When the child had chosen one of the items, the examiner said:

I know a lot about that. You ask me what you
want to know about it.

When the child has made five or more utterances, the examiner
moved on to the next item beginning with, "Put your hand in
and quickly take out one thing", and following the procedure
above.

Permissible Probes for Heuristic Task:

Select probes were again allowed as encouragement.

These are listed below:

    (Ask me) what I know (about that)
    (Ask me) more (questions)
    (Ask me) some more (questions)
    (Ask me) something else
    (Ask me) questions
    What (else) do you want to know about that?
    Think of some more you can ask me.
    You know some things about it but I know some
      more things. Ask me what you want to know.

In the event that the child said "I don't know", the exam-
iner said "Ask me what you don't know. I'll tell you".

Guidelines Over All Tasks

    In addition to instructions and probes, it was neces-
sary to set out guidelines for clarifying statements, answer-
ing the subject's questions and providing reinforcement
for effort. These are as follows:

    Clarification

    (a) Ask "What do you mean?"
    (b) Say "Tell me what you mean".
    (c) Repeat the subject's statement.
    (d) Request a repetition from the subject.

    Responses to Questions

    (a) Affirmation in full sentence.
    (b) Negation in full sentence.
    (c) Possibility (maybe) in full sentence.
    (d) Full sentence responses to wh-questions.
    (e) During the representational-imaginative, and
        personal tasks, responses to questions were
        given only where the response "Who, What, Where
        . . . do you think?" is inappropriate. (For
        example, the child in looking at the fighting
        boys picture asked what they were doing. The
        only response allowed was "What do you think?")

    Encouragement

    Descriptive reinforcement such as "You're telling a
      long story" was liberally given.

Tabulation of Scores

The entire language sample for each subject was tran-
scribed from tape recordings. The heuristic task will be
discussed later. Language collected in the representational-
imaginative task and in the personal task was segmented into
C-units following Loban's technique (1963, 5-9). Modifi-
cations and clarification necessary for scoring are in
Appendix F, along with a segmented sample. The corpus of
language for analysis was then selected by evenly distri-
buting the total number of C-units per task; namely twenty,
over the number of stimulus items per task. For example,
in the personal task, the twenty C-units are divided among
responses to each of four items leaving five C-units per
stimulus item. These five C-units have been arbitrarily
designated as the first five unrepeated C-units in response
to each stimulus item. Responses beyond the forty C-units
thus selected over personal and representational-imaginative
tasks were discarded as far as analysis was concerned.

MLU was calculated over twenty C-units per task using
special rules adopted by O'Donnell et al, (1967, 33) re-
garding contractions, compound-nouns and mazes. Additional
rules required for scoring were based on suggestions of
Sampson (1976). In Appendix G is a scored sample.

DSS (Lee, 1974) was also calculated over 17 to 20 sen-
tences distributed in a manner similar to that described

above. The corpus of utterances was analyzed in terms of grammatic categories. The DSS scoring chart (Lee, 1974) follows (page 42).

Supplementary scoring modifications in Appendix H are suggestions of Lee (1975). A brief scored example is also included at this point as an illustration of DSS scoring (page 44). Further examples are included in Appendix I.

In the following chapters, "DSS" will be used to refer to the overall score calculated by summing the scores over sentences and then computing the average. "DSS component categories" will refer to indefinite pronouns, personal pronouns, main verbs, secondary verbs, negatives, conjunctions, interrogative reversals and wh-questions. The term "class" will be adopted in reference to the group of utterances in a DSS category receiving the same weight and therefore considered to be at the same complexity level. For example, among indefinite pronouns the group including "it", "this" and "that" receives a weight of 1 and is identified as one class. The term "score" in reference to DSS component categories will be used only when the weights for each class or calculations involving these numbers are under examination. Thus, when the mean for five year olds' indefinite pronouns is being considered, "score" is the appropriate term. When the frequency of occurrence of the indefinite pronouns "nothing", "nobody", "none" and "no one" is under scrutiny the appropriate term is class. Here, the

Chart 8. The Developmental Sentence Scoring (DSS) Reweighted Scores

SCORE	INDEFINITE PRONOUNS OR NOUN MODIFIERS	PERSONAL PRONOUNS	MAIN VERBS	SECONDARY VERBS
1	it, this, that	1st and 2nd person: I, me, my, mine, you, your(s)	A. Uninflected verb: I see you. B. copula, is or 's: It's red. C. is + verb + ing: He is coming.	
2		3rd person: he, him, his, she, her, hers	A. -s and -ed: plays, played B. irregular past: ate, saw C. Copula: am, are, was, were D. Auxiliary am, are, was, were	Five early-developing infinitives: I wanna see (want to see) I'm gonna see (going to see) I gotta see (got to see) Lemme [to] see (let me [to] see) Let's [to] play (let [us to] play)
3	A. no, some, more, all, lot(s), one(s), two (etc.), other(s), another B. something, somebody, someone	A. Plurals: we, us, our(s), they, them, their B. these, those		Non-complementing infinitives: I stopped to play I'm afraid to look. It's hard to do that.
4	nothing, nobody, none, no one		A. can, will, may + verb: may go B. Obligatory do + verb: don't go C. Emphatic do + verb: I do see.	Participle, present or past: I see a boy running. I found the toy broken.
5		Reflexives: myself, yourself, himself, herself, itself, themselves		A. Early infinitival complements with differing subjects in kernels: I want you to come Let him [to] see B. Later infinitival complements: I had to go. I told him to go. I tried to go. He ought to go. C. Obligatory deletions: Make it [to] go. I'd better [to] go. D. Infinitive with wh-word: I know what to get I know how to do it.
6		A. Wh-pronouns: who, which, whose, whom, what, that, how many, how much I know who came. That's what I said. 2. Wh-word + infinitive: I know what to do. I know who(m) to take	A. could, would, should, might + verb: might come, could be B. Obligatory does, did + verb C. Emphatic does, did + verb	
7	A. any, anything, anybody, anyone B. every, everything, everybody, everyone C. both, few, many, each, several, most, least, much, next, first, last, second (etc.)	(his) own, one, oneself, whichever, whoever, whatever Take whatever you like.	A. Passive with get, any tense Passive with be, any tense B. must, shall + verb: must come C. have + verb + en: I've eaten D. have got: I've got it	Passive infinitival complement: With get I have to get dressed. I don't want to get him With be: I want to be pulled. It's going to be locked.
8			A. have been + verb + ing had been + verb + ing B. modal + have + verb + en: may have eaten C. modal + be + verb + ing: could be playing D. Other auxiliary combinations: should have been sleeping	Gerund: Swinging is fun. I like fishing. He started laughing.

NEGATIVES	CONJUNCTIONS	INTERROGATIVE REVERSALS	WH-QUESTIONS
it, this, that + copula or auxiliary is, 's, + not: It's not mine. This is not a dog. That is not moving.		Reversal of copula: *Isn't it red? Were they there?*	
			A. who, what, what + noun: *Who am I? What is he eating? What book are you reading?* B. where, how many, how much, what . . . do, what . . . for *Where did it go? How much do you want? What is he doing? What is a hammer for?*
	and		
can't, don't		Reversal of auxiliary be: *Is he coming? Isn't he coming? Was he going? Wasn't he going?*	
isn't, won't	A. but B. so, and so, so that C. or, if		when, how, how + adjective *When shall I come? How do you do it? How big is it?*
	because	A. Obligatory do, does, did: *Do they run? Does it bite? Didn't it hurt?* B. Reversal of modal: *Can you play? Won't it hurt? Shall I sit down?* C. Tag question: *It's fun, isn't it? It isn't fun, is it?*	
other negatives Uncontracted negatives: I can not go. He has not gone. Pronoun-auxiliary or pronoun-copula contraction: I'm not coming. He's not here. Auxiliary-negative or copula-negative contraction: He wasn't going. He hasn't been seen. It couldn't be mine. They aren't big.			why, what if, how come how about + gerund *Why are you crying? What if I won't do it? How come he is crying? How about coming with me?*
	A. where, when, how, while, whether (or not), till, until, unless, since, before, after, for, as, as + adjective + as, as if, like, that, than *I know where you are. Don't come till I call.* B. Obligatory deletions: *I run faster than you [run]. I'm as big as a man [is big]. It looks like a dog [looks].* C. Elliptical deletions (score 0): *That's why [I took it]. I know how [I can do it].* D. Wh-words + infinitive: *I know how to do it. I know where to go.*	A. Reversal of auxiliary have: *Has he seen you?* B. Reversal with two or three auxiliaries: *Has he been eating? Couldn't he have waited? Could he have been crying? Wouldn't he have been going?*	whose, which, which + noun *Whose car is that? Which book do you want?*

	Indefinite Pronoun	Personal Pronoun	Main Verb	Secondary Verb	Negative	Conjunction	Interrogative Reversal	Wh-question	Sentence Point	Total
1. I forget		1	1						1	3
2. When my mom and dad left and we had a baby sitter, I was being nice.		1,3 1	2, 2, 2			8, 3, 3			1	26
3. (and) When my mom and dad came back they bought us some presents.	3	1,3 3	2, 2			8, 3			1	26
4. (So) if we are good we get lots of of allowance and she doesn't do any-thing.	7	3,3 2	2, 1, 6		7	5, 3			1	40
5. We have to go to bed but we don't want to go.		3,3 3	1, 4	5, 5	4	5			1	31
6. Where did these come from?	3	3	6				6	2	1	18

DSS = 29.00

differentiation between "score" and "class" is one of
expediency without disregard for the fact that the two are
related.

In addition to overall DSS, DSS was calculated over
the five most complex (highest scoring) sentences per lang-
uage function regardless of the task in which they occurred.
MLU was also calculated over the five longest C-units in
the entire sample per task and DSS over the five most complex
(highest scoring) sentences per sample per task. The mean
score per sample per task was also calculated for each of
the following DSS component categories: indefinite pronouns,
personal pronouns, main verbs, secondary verbs, negatives
and conjunctions.

The frequencies of possible classes over the total five
year old language sample and over the total seven year old
language sample were calculated for each of the DSS compon-
ent categories. Similarly, the frequencies of possible
classes for each of the above DSS component categories were
calculated as follows:

1) over the total five year old language sample in
   the personal task and in the representational-
   imaginative task.

2) over the total seven year old language sample in
   the personal task and in the representational-
   imaginative task.

3) over the total language sample in the personal
   task and in the representational-imaginative
   task.

The language collected in the heuristic task was cate-

gorized with modified DSS procedures in the following manner. All of the questions asked by each child in this task were classified in both the interrogative-reversal and wh-question categories of DSS with the wh-question category being modified to include a class of zero weight for intonation questions (Cazden, 1972, 54). As above, only children who asked 17-20 questions were included. Means and frequencies of possible scores per category (wh-questions and interrogative reversals) were calculated.

In total, the analysis includes both global DSS scores and MLU scores for the personal and representational-imaginative tasks as well as linguistic description based on DSS categories for the language of all three tasks.

Reliability

Inter-rater reliability for DSS was evaluated using several single factor analyses of variance with repeated measures for the experimenter and two raters (ANOV14).[*] Each scored four samples to twenty utterances chosen at random from the data for the personal task and the representational-imaginative task. Results are in Table 2.

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[*] Program developed by the Division of Educational Research Services, Faculty of Education, University of Alberta.

Table 2

Measure	R_k
"Adjusted Reliabilities" Removing Mean Differences	
Indefinite Pronouns	0.918
Personal Pronouns	0.984
Main Verbs	0.565
Secondary Verbs	0.906
Negatives	0.965
Conjunctions	0.359
DSS	0.998
DSS of 5 longest sentences per task	0.998
MLU	0.984

These results indicate reliability of scoring on all of the measures except main verbs and conjunctions. The sources of disagreement were given closer attention. It appeared that one of the raters inconsistently scored items involving "is + verb + ing" as "2" rather than "1". The source of this error may lie in the fact that this is considered correct scoring in the unrevised version of DSS (Lee and Canter, 1971). The reliability of verb scores may also have been affected by one rater's failure to include attempt marks, and consequently scores of zero, in the overall score. This would have a greater effect on main verbs than on other categories since more errors (or attempt

marks) are found among the main verbs. Relatively few con-
junctions occurred in one of the samples used in checking
reliability. As a result disagreements on single items
were magnified. One such item is the scoring of "what" in
"I know what it is". One rater scored it as an "8" con-
junction similar to "I know where it is". The examiner and
the second rater scored it as a wh-pronoun. The limited
reliability results from the fact that scores for conjunc-
tions were as follows with the item discussed indicated:

	Sample 1	Sample 2	Sample 3	Sample 4
Examiner	3.00	3.00	3.88	4.24
Rater 1	5.50	3.00	3.88	4.30
Rater 2	3.00	3.00	3.44	4.05

Once scoring errors on main verbs and conjunctions were
corrected, inter-rater reliability was raised to 0.985 for
both. Overall, the inter-rater reliability of this study is
considered adequate.

Analysis and Interpretation of Data

In the present experimental design several analyses are
reported including both verbal and statistical description
of the data. One null hypothesis tested was that no differ-
ence exists between the means of the five year old group
and the seven year old group for five measures of linguistic
complexity (DSS, DSS of five most complex sentences per task,
DSS of five most complex sentences per function, MLU, MLU of
five longest C-units per task). A second null hypothesis

tested was that no difference exists between the means of the scores on the representational-imaginative task and the personal task on the same five overall measures of linguistic complexity. In testing these hypotheses, the present study may be considered a two (age group) by two (task) analysis of variance design. Because the same subjects undertook both tasks, it was necessary to account for correlated samples by using two way analysis of variance with repeated measures (Fergusen, 1971, 264). The Analysis of Variance (ANOV23) computer program* was selected to derive F ratios and thereby to determine significant differences between age groups or between tasks on the above overall measures of linguistic complexity. Identical procedures were used to test these null hypotheses: no difference exists between the means of the five year old group and the seven year old group for scores of DSS component categories (indefinite pronouns, personal pronouns, main verbs, secondary verbs, negatives and conjunctions) and no difference exists between the means of the representational-imaginative task and the personal task for the same measures.

Assumptions made in the use of two way analysis of variance with repeated measures are as follow (Steel and Torrie, 1960, 128; Winer, 1971, 522):

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*Program developed by the Division of Educational Research Services, Faculty of Education, University of Alberta.

1. Treatment and environmental effects are additive.

2. Experimental errors are random, independently and normally distributed about zero mean and with a common variance.

3. Sources of variation are homogeneous.

Additivity of effects implies that no interaction of task and age exists for this study. With regard to distribution of experimental errors, the ordinary F test is fairly robust and can be used without serious error even when considerable variations from normality occur (Keeping, 1962, 240). Homogeneity of variance is necessary in order for the F ratio to follow an F distribution although indications are that F tests are robust with respect to minor violations of this assumption (Winer, 1971, 522). Bartlett's test (Winer, 1971, 550) was used to test for homogeneity of variance. A subprogram of Analysis of Variance (ANOV25) computer program* was selected to derive chi-squares and thereby to determine the significance of differences in variance between age groups.

One further null hypothesis tested was that the distributions of frequencies of the possible classes for each DSS component category (indefinite pronouns, personal pronouns, main verbs, secondary verbs, negatives, conjunctions) do not differ significantly between the five year old group

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and the seven year old group. Similarly, the null hypothesis that the distributions of frequencies of the possible classes for each DSS component category above do not differ significantly between the representational-imaginative task and the personal task. In testing these hypotheses a Chi-square Test of Relatedness (Ferguson, 1971, 182) was performed. The computer program NONPØ2* was selected to derive chi-squares or to determine significant differences in the distribution of frequencies of possible classes per DSS component category between age groups and between tasks.

Assumptions in Chi-square Test of Relatedness are that discrete variables are involved and that individuals fall within well defined classes (Steel and Torrie, 1960, 352).

Further analysis of the data compiled for the representational-imaginative task and for the personal task includes the description of actual graphic representations of the scores achieved per age group, per task, per DSS component category. Analysis of the data for the heuristic task is limited to nonstatistical description of the means and distributions of interrogative-reversals and wh-questions per age group.

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* Program developed by the Division of Educational Research Services, Faculty of Education, University of Alberta.

CHAPTER V

RESULTS

The findings of data analysis are related to the cen-
tral concern of the study, namely linguistic complexity of
language samples collected in three tasks from two age
groups. The following results are based on a selection
of 17 to 20 sentences per subject per task for Develop-
mental Sentence Score (DSS) measures and 20 C-units per
subject per task for Mean Length of Utterance (MLU) mea-
sures.

The general design of the present study involves a
five year old group and a seven year old group whose lang-
uage was collected in a representational-imaginative task,
a personal task and a heuristic task. The results of the
heuristic task are considered separately. This gives rise
to a 2 x 2 factorial analysis with repeated measures taken
over the last factor.

Analysis of Overall Linguistic Scores

A two (age five/age seven) x two (representational-
imaginative task/personal task) analysis of variance with
the last factor repeated was performed using the following
linguistic measures as dependent variables:

1. Developmental Sentence Score (DSS)

2. DSS of the five most complex sentences per task

   3. DSS of the five most complex sentences per
      function

   4. Mean Length of Utterance (MLU)

   5. MLU of the five longest C-units per task.

These measures are described in the previous chapter. In
Tables 3 and 4 the linguistic complexity scores for all
thirty-eight subjects on both tasks are listed.

   The variances of the above groups of linguistic com-
plexity scores were evaluated in order to test the assump-
tion that homogeneity of variance existed. These variances
are reported in Table 5.

   Homogeneity of variance was evaluated using Bartlett's
test (Winer, 1972, 550). A summary of the results is in
Table 6.

   These results indicate homogeneity of variance for the
two age groups studied on the above measures. In addition
there were no significant interactions between age and
task on any of the linguistic complexity scores above.
Probabilities for interaction effects were as follows:
DSS 0.337, DSS of the five most complex sentences per
task 0.498, DSS of the five most complex sentences per
function 0.623, MLU 0.728, and MLU of the five longest
C-units per task 0.435. Consequently, the assumptions
necessary for further analysis are met.

Table 3

Raw Data for Overall Linguistic Measures of Five and
Seven Year Olds in Representational-Imaginative Task

Subjects	DSS	DSS of 5 most complex sentences per task	DSS of 5 most complex sentences per func-tion	MLU	MLU of 5 longest C-units
5 year olds					
1	6.85	12.60	12.60	5.15	7.80
2	6.15	11.00	11.00	5.05	7.60
3	10.70	19.20	19.20	6.15	10.20
4	16.30	38.20	36.00	7.90	13.60
5	10.80	23.00	30.40	7.95	12.80
6	12.05	19.20	25.40	6.60	9.00
7	13.89	26.80	26.80	6.30.	10.00
8	9.10	13.80	13.80	5.50	7.60
9	7.20	12.60	12.60	4.15	6.40
10	10.25	17.60	17.60	5.60	9.00
11	7.65	12.20	12.20	4.50	8.40
12	8.40	15.20	14.00	5.75	8.20
13	7.15	11.40	11.40	4.70	6.40
14	8.85	14.40	12.40	5.35	9.00
15	9.80	18.20	17.60	5.95	8.40
16	9.20	16.80	15.40	5.00	7.80
17	11.55	21.80	20.80	4.75	6.40
18	17.25	30.20	30.20	7.85	15.60
7 year olds					
1	16.90	30.40	30.40	8.30	14.20
2	16.95	31.80	31.80	6.65	12.40
3	18.35	30.20	30.20	7.80	12.80
4	22.61	41.00	41.00	8.80	16.80
5	6.60	9.00	9.00	5.20	7.80
6	15.18	26.20	26.20	7.10	11.40
7	19.47	31.40	31.40	8.00	12.20
8	17.47	27.40	27.40	7.75	13.60
9	13.78	26.20	26.20	8.90	13.40
10	14.60	27.40	27.40	7.35	10.40
11	11.95	22.40	20.00	5.50	8.80
12	14.20	24.20	24.20	6.75	10.80
13	19.10	36.40	36.40	7.65	11.60
14	15.20	33.40	31.60	7.15	14.00
15	9.70	19.60	19.60	7.00	10.00
16	17.95	41.40	41.40	6.05	9.40
17	13.40	24.80	24.80	7.05	11.80
18	9.10	14.60	14.60	5.20	9.00
19	13.50	26.20	26.20	6.60	9.00
20	15.00	34.40	34.40	7.00	10.80

Table 4

Raw Data for Overall Linguistic Measures of
Five and Seven Year Olds in Personal Task

Subjects	DSS	DSS of 5 most complex sentences per task	DSS of 5 most complex sentences per func- tion	MLU	MLU of 5 longest C-units
5 year olds					
1	8.60	16.20	16.20	5.60	7.60
2	10.00	18.20	18.20	5.45	8.80
3	12.82	25.60	25.60	7.05	11.60
4	15.71	29.00	31.20	8.20	14.20
5	19.15	36.40	33.60	8.65	13.20
6	19.95	48.00	42.80	7.30	13.80
7	14.75	24.40	24.40	7.35	12.60
8	17.76	30.40	30.40	8.20	12.20
9	11.85	19.80	20.00	6.30	9.20
10	19.10	44.40	44.40	7.50	12.60
11	10.30	18.60	16.80	4.25	6.40
12	7.85	13.20	14.40	4.90	8.20
13	13.30	24.60	24.60	6.30	9.00
14	7.00	13.00	15.00	5.35	7.60
15	10.05	18.60	20.40	5.60	8.20
16	11.35	23.20	23.20	7.05	14.80
17	16.45	34.20	34.20	8.15	12.40
18	15.30	23.00	23.00	6.90	10.80
7 year olds					
1	18.06	42.00	42.00	9.00	14.60
2	16.10	35.80	35.80	6.75	9.20
3	14.94	29.60	29.60	8.55	11.20
4	17.40	33.60	33.60	7.85	12.00
5	12.17	23.50	23.50	5.65	8.20
6	14.45	29.60	29.60	6.45	11.00
7	23.60	43.00	43.00	8.40	13.20
8	25.45	49.60	49.60	9.05	15.80
9	24.26	45.00	45.00	10.10	15.00
10	10.10	34.80	34.80	8.30	13.80
11	14.45	27.20	29.60	7.60	12.00
12	10.35	18.80	18.80	6.65	11.20
13	15.90	30.20	30.20	8.85	14.20
14	16.15	34.00	34.00	7.45	13.80
15	17.70	38.20	38.20	9.05	15.20
16	17.20	33.40	33.40	8.45	12.80
17	15.35	28.00	28.00	7.50	12.00
18	13.80	20.40	20.40	7.25	10.80
19	20.75	34.20	34.20	7.70	13.20
20	10.80	24.00	24.00	6.35	9.20

Table 5

Variances* of Overall Measures of Linguistic
Complexity for Five and Seven Year Olds in
Representational-Imaginative (RI) and
Personal (P) Tasks

Linguistic Complexity Measure	Five Year Olds	Seven Year Olds
DSS	9.78/16.57	14.63/17.48
DSS of 5 most complex sentences per task	52.67/98.98	63.33/66.40
DSS of 5 most complex sentences per function	59.50/80.77	69.12/65.29
MLU	1.35/ 1.62	1.11/ 1.27
MLU of 5 longest C-units per task	6.46/ 6.88	5.00/ 4.50

* Variances are reported as RI/P

Table 6

Summary of Bartlett's test of Homogeneity
of Variance of Overall Linguistic Scores

Measure	Chi Square	p
DSS	1.631	0.652
DSS of five most complex sentences per task	1.850	0.604
DSS of five most complex sentences per function	0.445	0.931
MLU	6.393	0.887
MLU of five longest C-units per task	1.075	0.783

Table 7 presents the means of the two age groups in each task for each of the five linguistic complexity measures mentioned above.

Table 7

Age (Years)	Linguistic Complexity Measure	Representational-Imaginative Task Means	Personal Task Means
Mean Linguistic Complexity Scores of Two Age Groups in Two Tasks			
5	DSS	10.17	13.40
	DSS of 5 most complex sentences per task	18.57	15.60
	DSS of 5 most complex sentences per function	18.86	25.47
	MLU	5.79	6.67
	MLU of 5 longest C-units per task	9.12	10.73
7	DSS	15.05	16.95
	DSS of 5 most complex sentences per task	27.92	32.74
	DSS of 5 most complex sentences per function	27.71	32.86
	MLU	7.09	7.85
	MLU of 5 longest C-units per task	11.51	12.42

Table 8 presents a summary of the analysis of variance comparing the five year old group with the seven year old

Table 8

Summary of Analysis of Variance of the
Linguistic Complexity Scores by Age

Measure	F Ratio*	p
DSS	16.356	0.000
DSS of 5 most complex sentences per task	14.188	0.001
DSS of 5 most complex sentences per function	13.344	0.001
MLU	14.040	0.001
MLU of 5 longest C-units per task	10.367	0.003

* df = 1

group in terms of mean scores for DSS, DSS of the five
most complex sentences per task, DSS of the five most com-
plex sentences per function, MLU and MLU of the five long-
est C-units per task. The null hypothesis being tested
was as follows:

> The means for the five year old group and a seven
> year old group do not differ significantly over
> the five measures of overall linguistic complexity
> chosen for examination in this study. $\bar{X}_5 = \bar{X}_7$,
> where X is a linguistic complexity score and the
> subscripts are ages.

The probability levels indicate a significant difference

exists between five year olds and seven year olds for all

of the linguistic complexity scores evaluated. The null

hypothesis was rejected at $p < 0.01$ for each of the five

linguistic complexity measures.

Table 9 presents a summary of the analysis of variance comparing the scores on representational-imaginative tasks with scores on the personal task for the five measures of linguistic complexity evaluated. The null hypothesis being tested was as follows:

> The means for scores on a representational-imaginative task and a personal task do not differ significantly over the five measures of linguistic complexity chosen for examination in this study. $\bar{X}_1 = \bar{X}_2$, where X is a linguistic complexity score and 1 and 2 are representational-imaginative and personal tasks respectively.

Table 9

Summary of Analysis of Variance of the Linguistic Complexity Scores by Task

Measure	F Ratio*	P
DSS	14.064	0.001
DSS of 5 most complex sentences per task	13.536	0.001
DSS of 5 most complex sentences per function	16.086	0.000
MLU	21.748	0.000
MLU of 5 longest C-units per task	8.066	0.007

* df = 1

The probability levels for F ratios here indicate significant differences exist between the language collected in

the representational-imaginative task and that collected
in the personal task with regard to the above measure of
linguistic complexity. Null hypothesis was rejected at
$p < 0.01$ for each of the five measures.

The overall results of analysis of variance indicate
significant main effects for age and task on the mean
linguistic complexity scores. Five and seven year old
boys differ in the overall linguistic complexity of their
spontaneous language. Inspection of group means revealed
that seven year olds presented syntactically more complex
utterances. In addition, the overall linguistic complexity
of the spontaneous language collected varies with the
task in which the language is requested. Here inspection
of the means per task revealed that the subjects presented
syntactically more complex utterances in the personal task
than in the representational-imaginative task. The ab-
sence of interaction between age and task implies that the
effect of task on seven year olds' linguistic complexity
is not significantly different from the effect of task on
five year olds' linguistic complexity. The finding that
the two age groups are homogeneous, with respect to mea-
sures of linguistic complexity, implies that the distri-
bution of individual scores about the group mean score
is the same in both age groups.

Analysis of DSS Component Category Scores

Further analysis also utilizing 2 x 2 analysis of

variance with repeated measures on the last factor was performed using the following component categories of DSS as dependent variables:

1. Independent Pronouns
2. Personal Pronouns
3. Main Verbs
4. Secondary Verbs
5. Negatives
6. Conjunctions

Both the interrogative-reversal and wh-question categories were eliminated from formal analysis because of the relative infrequency of occurrence: (There were only 17 interrogative reversals for both tasks combined for seven year olds and 66 for five year olds. There were only 9 wh-questions for both tasks combined for each age group as well). Table 10 gives the mean scores for all thirty-eight subjects on both tasks for DSS component categories.

The variances of the above groups of DSS component category scores were evaluated in order to test the assumption that homogeneity of variance existed. These variances are reported in Table 11 (on page 64).

Homogeneity of variance for the mean developmental scores within each DSS component category studied was evaluated using Bartlett's test (Winer, 1971, 550). A summary of the results is in Table 12 (page 64).

These results indicate that homogeneity of variance exists for personal pronouns and negatives only. Consequently, analysis of variance for the mean scores within

Table 10

Mean Scores* for all subjects for DSS Component Categories in Representational-Imaginative (RI) and Personal (P) Tasks

Sub-jects (Years)	Indefinite Pronouns	Personal Pronouns	Main Verb	Secondary Verb	Negatives	Conjunctions	Interrogative Reversals	Wh-question
5 yrs								
1	2.45/2.11	1.89/1.30	1.57/1.73	3.00/8.00	4.00/5.50	/6.00	2.50/1.67	2.00/3.00
2	2.40/2.43	2.35/1.34	1.50/2.36	0.00/4.00	4.00/4.00	3.00/4.14		
3	2.00/3.22	2.64/1.59	3.31/1.61	4.50/3.00	4.10/0.00	3.86/4.33	/6.00	2.00/
4	1.83/1.50	2.41/1.33	2.66/1.80	3.63/4.40	4.00/6.25	4.86/4.44	4.00/	2.00/
5	1.25/1.67	2.32/1.09	1.13/1.80	3.50/5.08	7.00/	7.00/5.69		
6	2.17/2.88	2.72/1.74	2.63/2.40	1.33/4.40	/6.40	4.00/4.78	0.00/	
7	2.62/2.23	2.31/1.81	2.56/2.94	3.67/4.40	5.40/6.00	3.50/3.42		
8	1.86/1.86	2.11/1.83	1.57/1.78	2.25/4.54	4.00/3.00	3.00/3.83		
9	3.40/	1.94/1.00	2.52/2.76	5.00/5.00	4.00/7.00	/6.00		
10	2.00/4.00	2.20/2.20	1.79/1.87	5.00/5.29	/5.80	3.75/4.44		
11	1.14/1.55	2.42/1.21	1.95/1.78	2.43/	4.00/4.00	3.00/5.22	/6.00	
12	2.20/1.25	1.94/1.41	1.50/1.65	2.80/6.80	4.00/4.00	4.75/3.00		/5.60
13	1.67/2.00	2.68/1.59	2.14/1.69	1.50/6.57	4.00/7.00	3.00/3.00		
14	3.00/2.00	2.40/1.36	1.48/1.32	4.00/5.00	4.00/4.00	3.75/4.75	6.00/	
15	1.58/1.67	1.72/1.50	1.88/1.81	2.83/3.00	2.67/7.00	3.60/4.13	1.00/1.00	2.00/
16	2.20/1.58	2.31/1.63	2.96/2.07	2.00/0.00	4.00/3.89	4.00/4.60	6.00/	
17	1.50/2.08	2.48/1.65	2.26/2.00	5.00/4.83	4.00/4.00	3.64/5.29	2.00/0.33	5.00/
18	2.25/1.00	1.96/1.59	2.60/1.73	4.14/5.17	5.67/5.75	4.90/4.82	0.00/6.00	2.00/
7 yrs								
1	2.39/1.92	3.05/1.64	1.65/2.12	2.92/7.44	5.00/7.00	3.41/4.24		
2	2.20/1.80	2.31/1.36	2.14/1.97	4.82/5.06	4.00/7.00	3.94/4.06		
3	2.10/2.13	2.71/1.35	1.84/1.85	4.75/5.00	4.67/2.33	5.19/4.73		

Table 10 continued

Sub-jects	Indefinite Pronouns	Personal Pronouns	Main Verb	Secondary Verb	Negatives	Conjunctions	Interrogative Reversals	Wh-question
7 yrs								
4	2.14/1.49	2.54/1.37	2.31/2.40	4.11/4.40	5.00/7.00	3.39/4.72		
5	1.00/3.00	2.56/1.00	1.55/2.31	3.00/2.60	4.00/6.14	3.00/3.00		
6	2.13/2.83	2.24/1.47	1.83/2.25	3.27/5.00	7.00/5.00	3.71/5.14		
7	2.25/1.93	2.74/1.31	3.10/2.06	4.38/6.20	7.00/7.00	3.45/5.27	6.00	
8	1.80/2.43	2.36/1.27	1.68/2.77	4.11/6.00	7.00/5.50	4.20/4.64	1.00	2.00
9	2.10/2.33	2.44/1.72	1.61/1.82	4.30/4.17	5.00/7.00	3.00/5.00		
10	2.20/2.33	2.75/1.82	2.03/2.05	3.78/6.38	/5.50	4.00/5.16	0.00	
11	2.57/2.40	2.59/1.94	2.04/1.85	4.63/5.50	4.00/5.40	3.63/4.62	4.00	
12	2.87/3.00	2.73/1.36	2.17/2.04	2.20/4.40	5.50/4.60	3.33/4.33		
13	1.87/3.15	2.67/1.20	1.84/1.85	2.78/5.00	3.40/3.80	4.85/4.90		
14	2.08/1.87	2.31/1.37	1.74/2.02	5.29/3.80	/7.00	4.10/4.67		
15	2.00/3.00	2.71/1.60	1.39/2.00	5.00/3.60	0.00/5.00	3.88/4.89	1.00/0.00	2.00
16	2.18/2.44	2.43/1.64	2.04/2.10	4.44/4.00	7.00/7.00	3.76/4.68	6.00	
17	2.13/1.20	2.13/1.39	2.00/1.83	3.54/7.00	/	3.40/4.20	4.00	
18	3.33/2.43	2.19/1.42	2.23/1.68	4.14/5.00	5.00/3.00	/4.06		
19	1.67/2.60	2.68/1.73	2.54/2.04	3.50/3.88	4.00/5.00	3.47/3.79		
20	2.50/2.14	2.52/1.54	1.79/1.68	4.45/4.67	7.00/5.50	3.14/4.08		

* All scores are reported as RI/P

Table 11

Variances* of DSS Component Category Scores of
Five Year Olds and Seven Year Olds for Represen-
tational-Imaginative(RI) and Personal (P)
Tasks

DSS Component Category	Five Year Olds	Seven Year Olds
Indefinite Pronouns	0.33/0.73	0.21/0.28
Personal Pronouns	0.08/0.08	0.05/0.05
Main Verbs	0.37/0.17	0.15/0.07
Secondary Verbs	1.96/4.06	0.68/1.44
Negatives	2.76/4.47	6.05/3.49
Conjunctions	1.86/0.81	1.01/0.20

*Scores are reported as RI/P

Table 12

Summary of Bartlett's Test of Homogeneity of
Variance for the Mean Scores within DSS Com-
ponent Categories

Category	Chi Square	p
Indefinite Pronouns	8.059	0.045
Personal Pronouns	1.917	0.590
Main Verbs	12.567	0.006
Secondary Verbs	14.033	0.003
Negatives	3.017	0.389
Conjunctions	13.663	0.003

DSS component categories maybe interpreted meaningfully for these scores only.

Table 13 presents the means of the two age groups for the six DSS component categories named above although only negatives and personal pronouns scores will be subject to analysis of variance.

Table 13

Mean DSS Component Scores of
Two Age Groups in Two Tasks

Age (Years)	DSS Component Category	Represen-tative-Imaginative Task Means	Personal Task Means
5	Indefinite Pronouns	2.084	1.975
	Personal Pronouns	2.266	1.509
	Main Verbs	2.112	1.950
	Secondary Verbs	3.143	4.416
	Negatives	3.819	4.644
	Conjunctions	3.367	4.549
7	Indefinite Pronouns	2.175	2.321
	Personal Pronouns	2.533	1.475
	Main Verbs	1.976	2.034
	Secondary Verbs	3.970	4.955
	Negatives	4.228	5.288
	Conjunctions	3.542	4.509

Tables 14 and 15 present a summary of the analysis of variance for negative scores and personal pronoun scores between age groups and between tasks. The null hypotheses being tested are as follows:

1. The means for a five year old group and a seven year old group do not differ significantly for personal pronouns or for negatives. $\bar{X}_5 = \bar{X}_7$ where X represents personal pronoun scores and 5 and 7 represent ages. $\bar{Y}_5 = \bar{Y}_7$, where Y represents negative score and 5 and 7 represent ages.

2. The means for scores on a representational-imaginative task and a personal task do not differ significantly for personal pronouns or for negatives. $\bar{X}_1 = \bar{X}_2$ where X represents personal pronoun score and 1 and 2 represent representational-imaginative and personal task respectively. $\bar{Y}_1 = \bar{Y}_2$ where Y represents negative score and 1 and 2 represent representational-imaginative and personal task respectively.

3. There is no age x task interaction for personal pronouns or for negatives.

Table 14

Summary of Analysis of Variance of Mean Personal Pronoun Scores for Five and Seven Year Olds on Two Tasks

	F Ratio	p
Comparing Five and Seven Year Old Age Groups	3.187	0.083
Comparing Representational-Imaginative and Personal Tasks	286.967	0.000
Interaction of Age and Task	7.911	0.008

Table 15

Summary of Analysis of Variance of Mean
Negative Scores for Five and Seven Year
Olds on Two Tasks

	F Ratio	p
Comparing Five and Seven Year Old Age Groups	1.238	0.273
Comparing Representational- Imaginative and Personal Tasks	4.012	0.053
Interaction of Age and Task	0.062	0.805

These results indicate no significant main effect for age
for either personal pronouns or negatives. The null hypoth-
eses were accepted. This implies that there is no signifi-
cant difference between age groups on these variables. The
results do, however, indicate significant differences
between the two tasks with regard to personal pronoun scores.
The null hypotheses was rejected at $p < 0.0001$. A signifi-
cant interaction exists between age and task for this vari-
able. The null hypotheses was accepted for personal pro-
nouns. Interaction implies that though comparison of mean
scores reveals the score for the representational-imaginative
task to be above that for the personal task in both age
groups, the effect of task is greater in the case of the
seven year olds. Difference between the two tasks in

negative scores approach significance at the 0.05 level.
The null hypothesis was rejected at p = 0.053. This
implies that differences between the two tasks regarding
negative scores exist but are less significant than those
regarding personal pronoun scores.

In summary, the distributions of scores about the
mean for main verb, secondary verb, conjunction and indef-
inite pronoun scores differ significantly between the two
age groups. The five year old group shows consistently
more variance for these scores, consequently, analysis
of difference between the means cannot be interpreted.
No differences between age groups regarding personal pro-
nouns and negative scores were indicated when analysis
of variance was interpreted; however, significant differ-
ences exist between tasks on these measures. It was there-
fore necessary to employ a second analysis to describe
existing differences between ages and tasks on DSS compon-
ent category scores.

Analysis of Distributions within Component Categories

Each DSS component category is divided into five or
seven possible classes and consequently given five or
seven discrete scores. For example, an indefinite pronoun
may be classified as a 0, 1, 3, 4, or 7. (See Chapter IV
for scoring). Above, the DSS component categories were
examined in terms of the central tendencies of the scores
and the variance about the group mean score. At this

point it is expedient to refer to the classes within each DSS component category since it is the frequency of occurrence of each class rather than summary of scores which is under scrutiny. Analysis of the distribution of the frequencies of each possible class within a component category was necessary in order to determine whether differences existed between distributions of frequencies of the classes of the two age groups or between distributions of frequencies of the classes in the two tasks. For the example above, do seven year olds receive more 7's, less 4's and the same number of 3's as five year olds or are results in the personal task clustered at 4 and 7 while in the representational-imaginative task they are clustered at 0, 1 and 3? A chi-square test of relatedness would test the hypothesis that the five and seven year old groups' distributions of frequencies of possible classes are the same or that the distributions of frequencies of possible classes are the same for the two tasks.

Further analysis employing a chi-square test of relatedness was performed with indefinite pronouns, personal pronouns, main verbs, secondary verbs, negatives and conjunctions in order to determine differences in the distributions of the frequencies of possible classes within each DSS component category named above. Tests were conducted using age and then task as independent variables.

Table 16 summarizes the chi-square tests of relatedness

between the frequencies of classes in each DSS component

category for the five year old group and the seven year

old group in the two tasks. The null hypotheses tested

were as follows:

> The distributions of frequencies of possible
> classes for indefinite pronouns do not differ
> significantly between the five year old group
> and the seven year old group. Similarly, there
> are no differences in the distributions of
> frequencies of possible classes for personal
> pronouns, main verbs, secondary verbs, negatives
> or conjunctions between the two age groups.

Table 16

Summary of Chi-Square Tests of Relatedness
between the Distributions of Frequencies of
Classes in Each DSS Component Category by
Age

Task	DSS Component Category	Chi-Square	df	p
Represen-tational-Imaginative	Indefinite Pro-nouns	4.197	3	0.24
	Personal Pronouns	42.880	6	0.000
	Main Verbs	54.024	6	0.000
	Secondary Verbs	20.744	6	0.002
	Negatives	17.073	3	0.001
	Conjunctions	5.053	3	0.118
Personal	Indefinite Pronouns	2.772	4	0.517
	Personal Pronouns	10.653	5	0.059
	Main Verbs	46.717	6	0.000
	Secondary Verbs	17.246	6	0.000
	Negatives	1.294	4	0.962
	Conjunctions	5.895	3	0.117

These results indicate that the distributions of the frequencies of possible classes within each DSS component category differed between age groups for the representational task for all but indefinite pronouns and conjunctions. The null hypothesis was rejected for these categories at $p < 0.01$. For the personal task only the main verb and the secondary verb categories are significantly different in distribution of frequencies of possible classes between five and seven year olds. The null hypothesis for these categories was rejected at $p < 0.0001$. However, chi-square for personal pronoun classes in the personal task approaches significance at 0.05 for difference between age groups. The null hypothesis was rejected at $p = 0.059$. In summary, a difference may be said to exist between the age groups in terms of the frequency of various complexities of personal pronouns, main verbs and secondary verbs used in both tasks.

Table 17 summarizes the chi-square tests of relatedness between the distributions of frequencies of possible classes of the DSS component categories for the representational-imaginative task and the personal task. The null hypotheses tested were as follows:

> The distributions of frequencies of possible classes for indefinite pronouns do not differ significantly between the representational-imaginative task and the personal task. Similarly, there are no differences in the distributions of frequencies of possible classes for personal pronouns, main verbs, secondary verbs, negatives or conjunctions between the two tasks.

Table 17

Summary of Chi-Square Tests of Relatedness
between Distributions of Frequencies of
Classes for Each DSS Component Category by
Task

Age (Years)	DSS Component Category	Chi-Square	df	p
5	Indefinite Pronouns	5.925	4	0.205
	Personal Pronouns	281.418	5	0.000
	Main Verbs	40.883	5	0.000
	Secondary Verbs	52.22	6	0.000
	Negatives	21.940	4	0.000
	Conjunctions	15.490	3	0.001
7	Indefinite Pronouns	5.493	4	0.240
	Personal Pronouns	519.649	6	0.000
	Main Verbs	46.981	6	0.000
	Secondary Verbs	52.27	6	0.000
	Negatives	5.808	4	0.214
	Conjunctions	38.774	3	0.000

These results indicate a significant difference in
the distributions of frequencies of possible classes of
both age groups between the representational-imaginative
task and the personal task for the following DSS component
categories: personal pronouns, main verbs, secondary verbs
and conjunctions. The implication here is that the fre-
quency with which subjects used the various complexities

within the categories named above differs from the repre-
sentational-imaginative task to the personal task. The
same statement applies to the category of negative classes
for the five year old group, though not for the seven year
old group. In summary, the distribution frequencies of
possible scores within each DSS component category varied
from task to task for the five year olds, with the excep-
tion of indefinite pronouns and negatives.

The following figures graph the distributions of
frequencies within the classifications for each DSS com-
ponent category. The ordinate represents the frequency
of classes for the entire group or task involved. The
abscissa represents the possible classification for the
category (See Chapter IV for scoring). Six graphs repre-
sent each component category for the following comparisons:

1. five year olds over two tasks
2. seven year olds over two tasks
3. representational-imaginative task over
   two ages
4. personal task over two ages
5. both ages over two tasks
6. both tasks over two ages

Figures 1 through 6 represent comparisons between age
groups and between tasks for the distributions of frequen-
cies of possible indefinite pronoun classes. In all classes
the most frequently used class of pronouns was the class
including "it, this and that". The second most frequently
used class includes more complex noun modifiers "no, some,
more, all, lot(s), one(s), two (and other numbers), other(s)

of Indefinite Pronoun Classes of Seven Year Olds

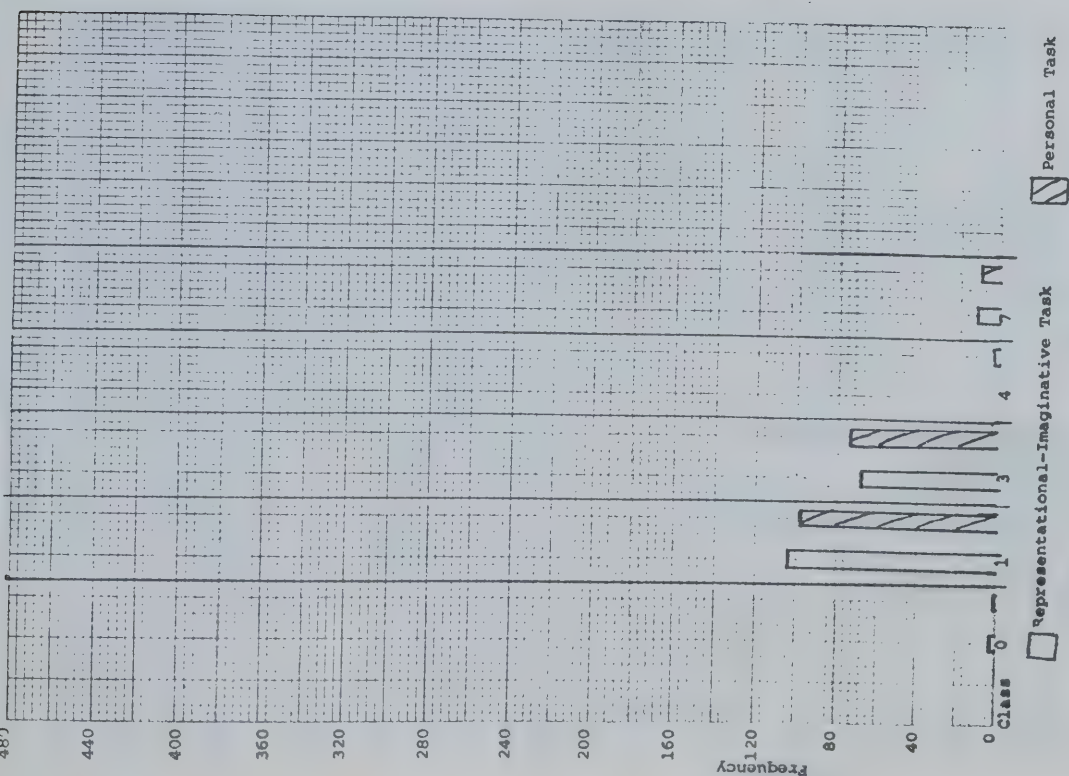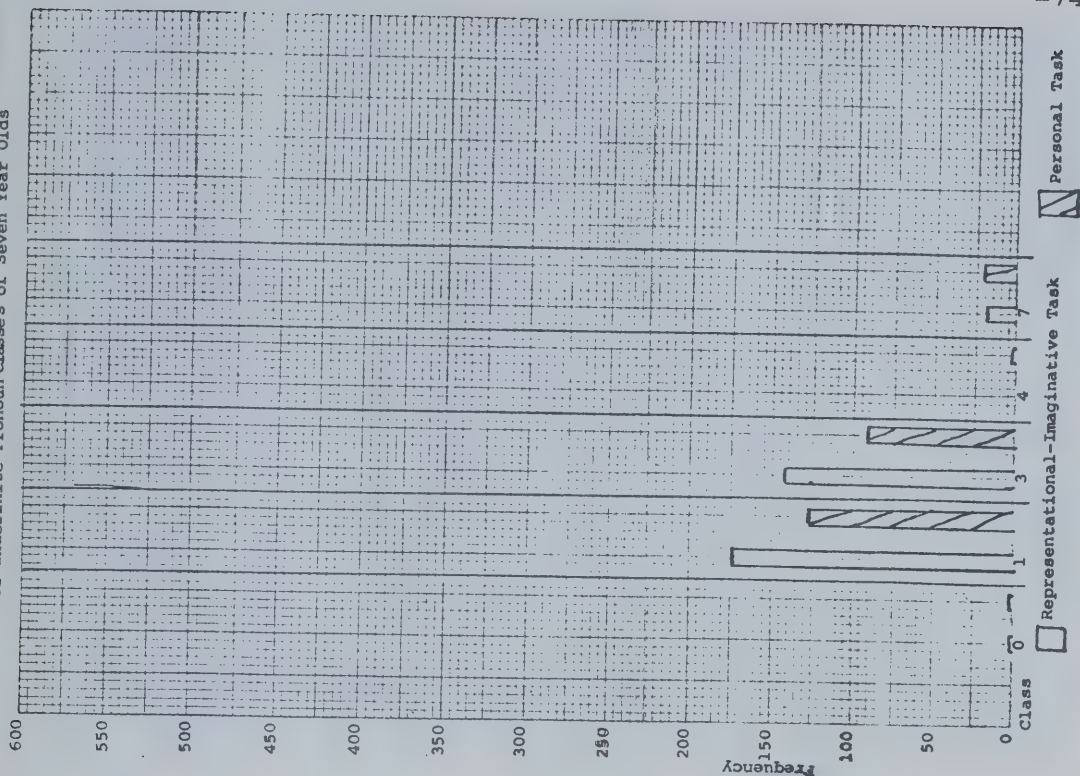Figure 3. Five and Seven Year Olds: Frequency of Indefinite Pronoun Classes in Representational-Imaginative Task

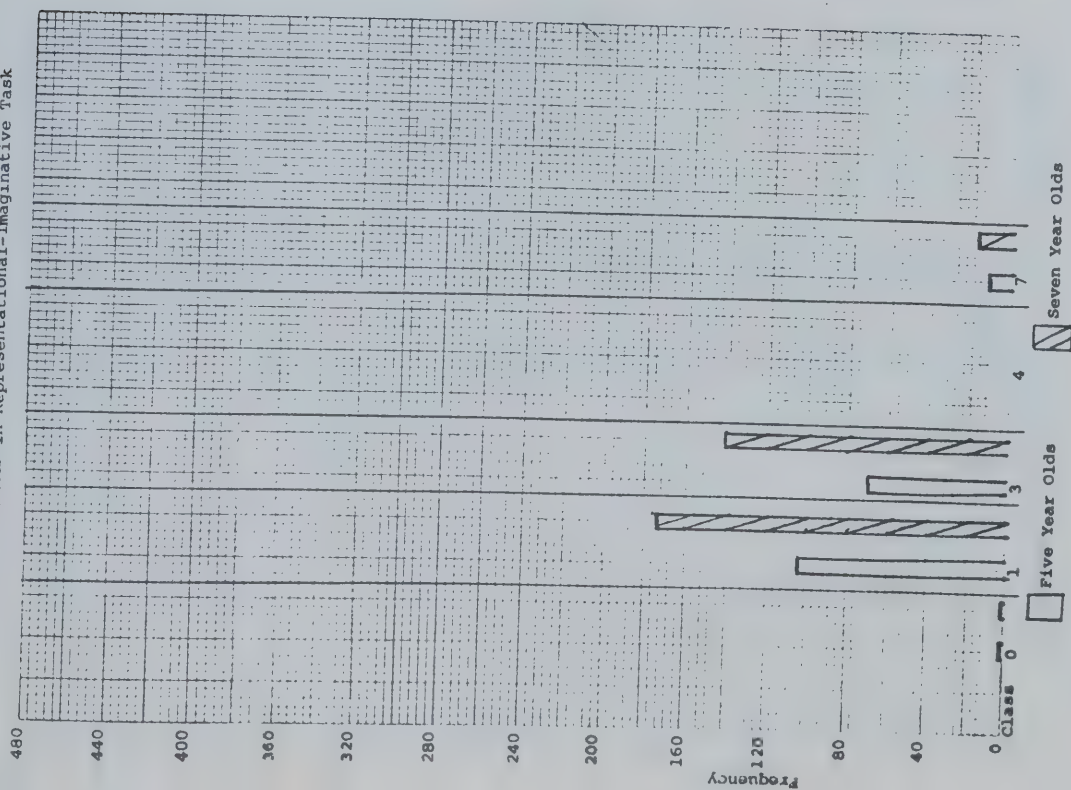Figure 4. Five and Seven Year Olds: Frequency of Indefinite Pronoun Classes in Personal Task

Figure 6. Five and Seven Year Olds: Frequency of Indefinite
Pronoun Classes in Two Tasks

Figure 5. Representational-Imaginative and Personal Tasks:
Frequency of Indefinite Pronoun Classes of Both Ages
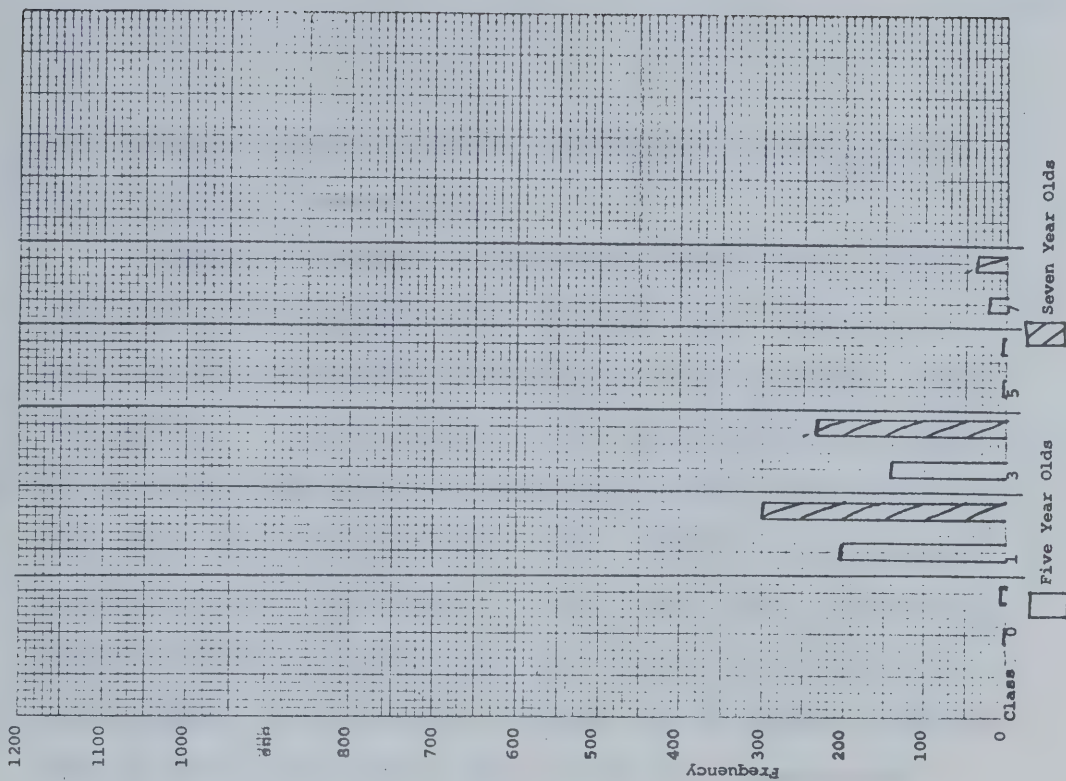
and another" and more complex indefinite pronouns "some-
one, somebody, something".

Figures 7 through 12 represent comparisons between
age groups and between tasks for the distributions of
frequencies of possible personal pronoun classes. Among
the personal pronouns used in the representational-imagin-
ative task, five year olds used 3rd person pronouns, "he,
him, his, she, her and hers" most. These were followed
by plurals "we, us, our(s), they, them, their, these and
those" and then by first and second person pronouns "I,
me, my, mine, you, your(s)". Among the personal pronouns
used by seven year olds, this order was altered with
plural pronouns being used most, followed by third person
pronouns and then by second person pronouns. By way of
contrast, in the personal task, both five and seven year
olds used first and second person pronouns most, followed
in the case of five year olds by plural pronouns and then
third person pronouns. In the case of seven year olds,
first and second person pronouns are followed in order of
frequency by third person pronouns and then by plural pro-
nouns. Few other pronouns were used by either age group
in either task.

Comparisons between age groups and between tasks for
the distribution of frequencies of main verb classes are
represented in Figures 13 through 18. In the personal
task, the most frequently used class of verbs for both

Figure 8. Representational-Imaginative and Personal Tasks: Frequency of Personal Pronoun Classes of Seven Year Olds

Figure 7. Representational-Imaginative and Personal Tasks: Frequency of Personal Pronoun Classes of Five Year Olds

Figure 10. Five and Seven Year Olds: Frequency of Personal Pronoun Classes in Personal Task

Figure 9. Five and Seven Year Olds: Frequency of Personal Pronoun Classes in Representational-Imaginative Task
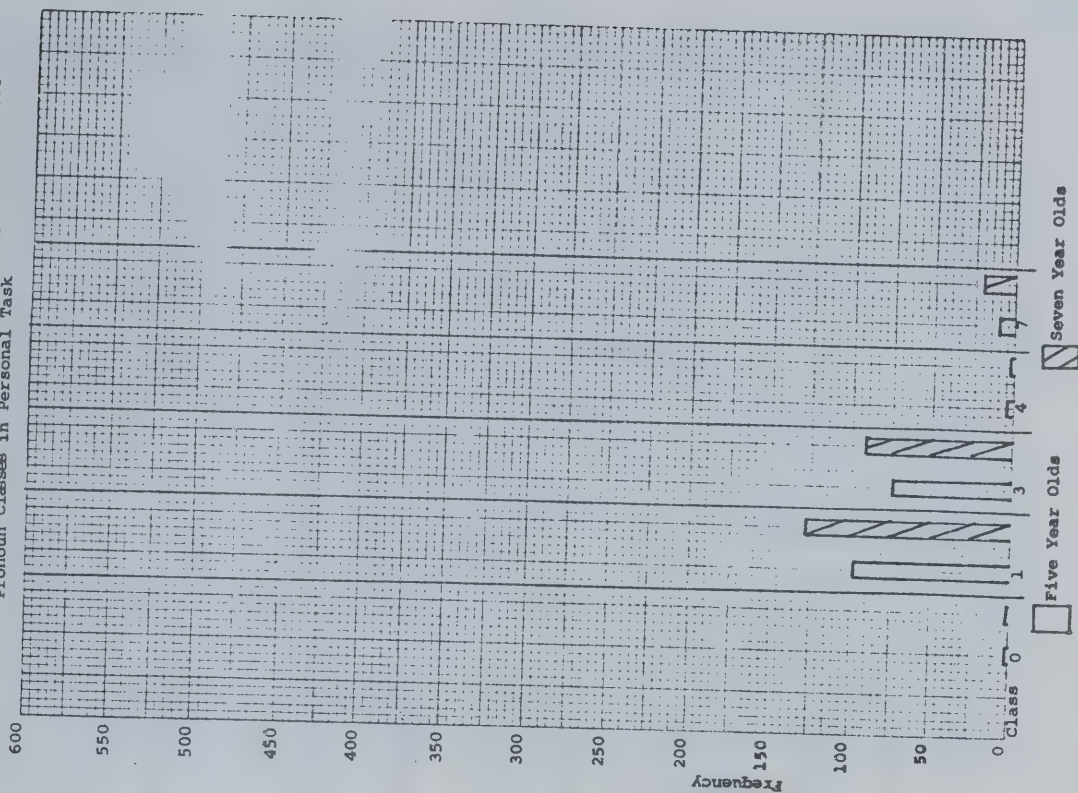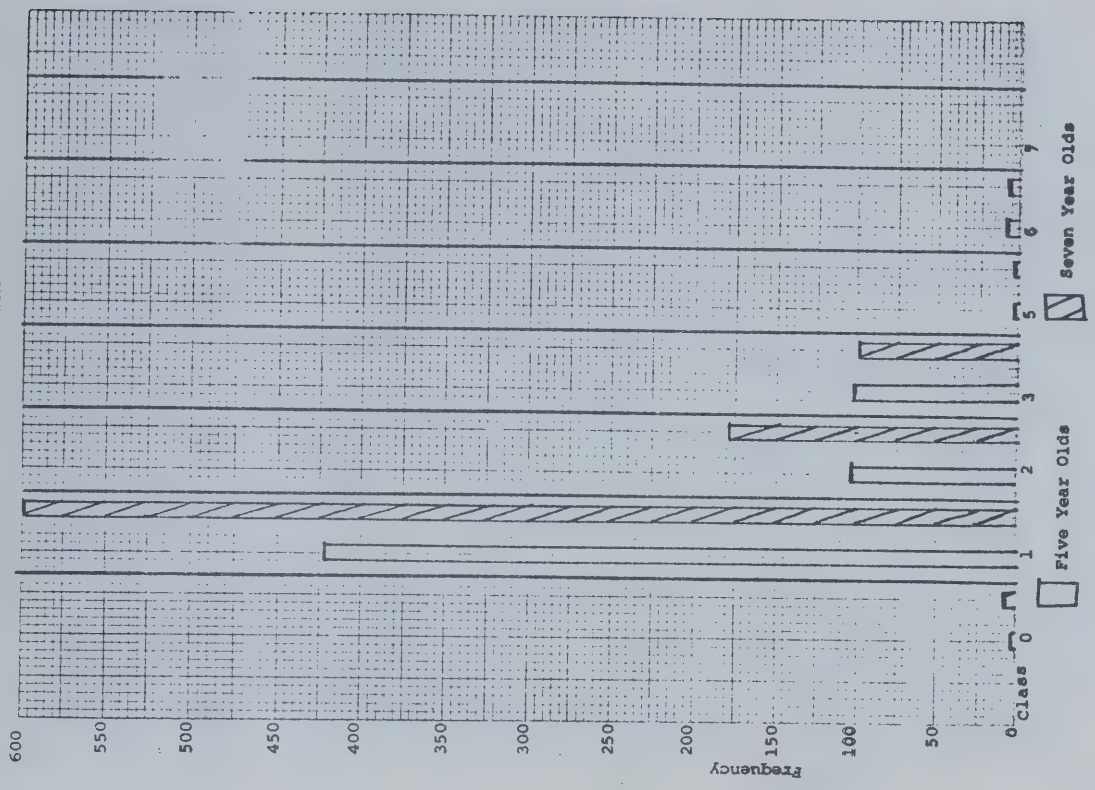
Figure 11. Representational-Imaginative and Personal Tasks: Frequency of Personal Pronoun Classes of Both Ages

Figure 12. Five and Seven Year Olds: Frequency of Personal Pronoun Classes in Two Tasks
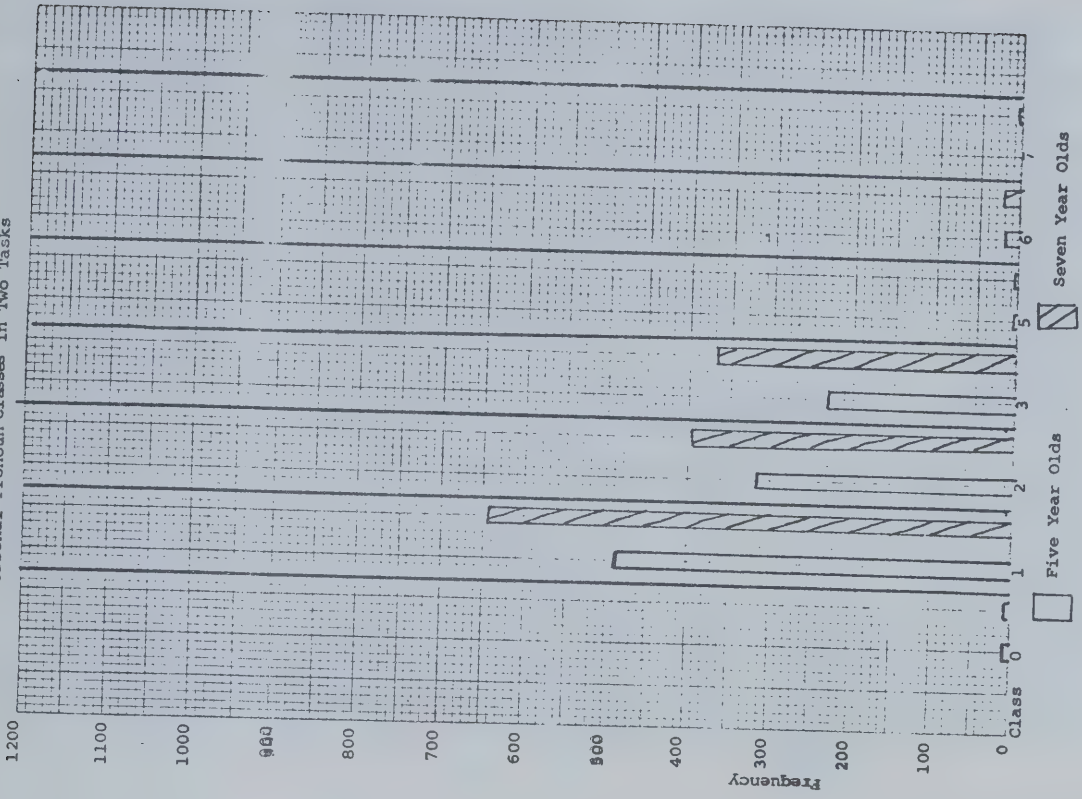
Figure 13. Representational-Imaginative and Personal Tasks: Frequency of Main Verb Classes of Five Year Olds

Figure 14. Representational-Imaginative and Personal Tasks: Frequency of Main Verb Classes of Seven Year Olds

Figure 15. Five and Seven Year Olds: Frequency of Main Verb Classes in Representational-Imaginative Task

Figure 16. Five and Seven Year Olds: Frequency of Main Verb Classes in Personal Task

Figure 18. Five and Seven Year Olds: Frequency of Main Verb Classes in Two Tasks

Figure 17. Representational-Imaginative and Personal Tasks: Frequency of Main Verb Classes of Both Ages
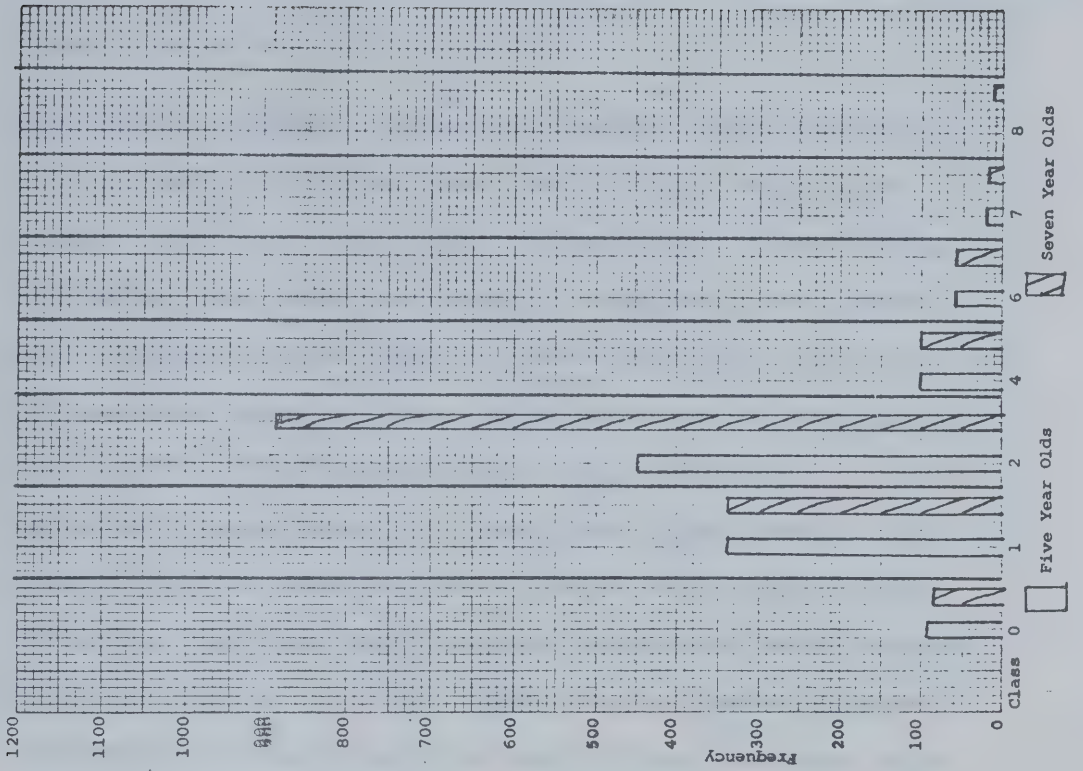
age groups includes simple third person past inflections,
"-s and -ed", irregular past inflections, "ate, saw",
copula, "am, are, was, were" and auxiliary, "were going,
was going, are going, am going". Similarly, the second
most frequently used class of verbs for both age groups in
the personal task includes uninflected verbs, the copula
"is" and the third person auxiliary, "is going". In the
representational task, the seven year olds present the
same pattern of most and second most used verb classes
while the five year olds reverse this order using simpler
forms more often. In the higher scoring verbs, greater
variability between tasks is seen in the five year olds'
results than in the seven year olds' results. Generally,
the difference between tasks and ages in distribution of
classes is attributable to the five year olds' preference
for simpler verb forms in the representational-imaginative
task.

Figures 19 through 24 graph the comparisons between
age groups and between tasks for the distribution of fre-
quencies of possible secondary verb classes. For the
representational-imaginative task, both age groups used
the early developing infinitives most: "wanna see, gonna
see, gotta see and lemme see". In the personal task, how-
ever, both groups used infinitives of a higher scoring
class most often, the difference being more marked for
the five year olds. Included in this class are infinitival

Figure 19. Representational-Imaginative and Personal Tasks: Frequency of Secondary Verb Classes of Five Year Olds
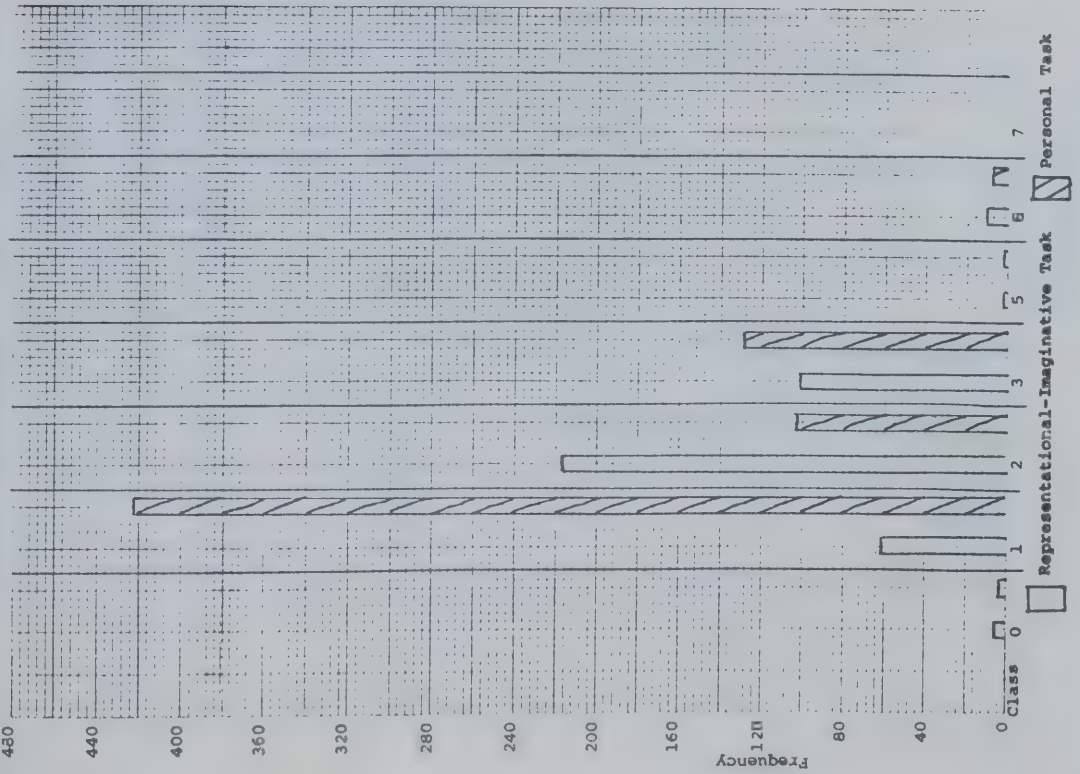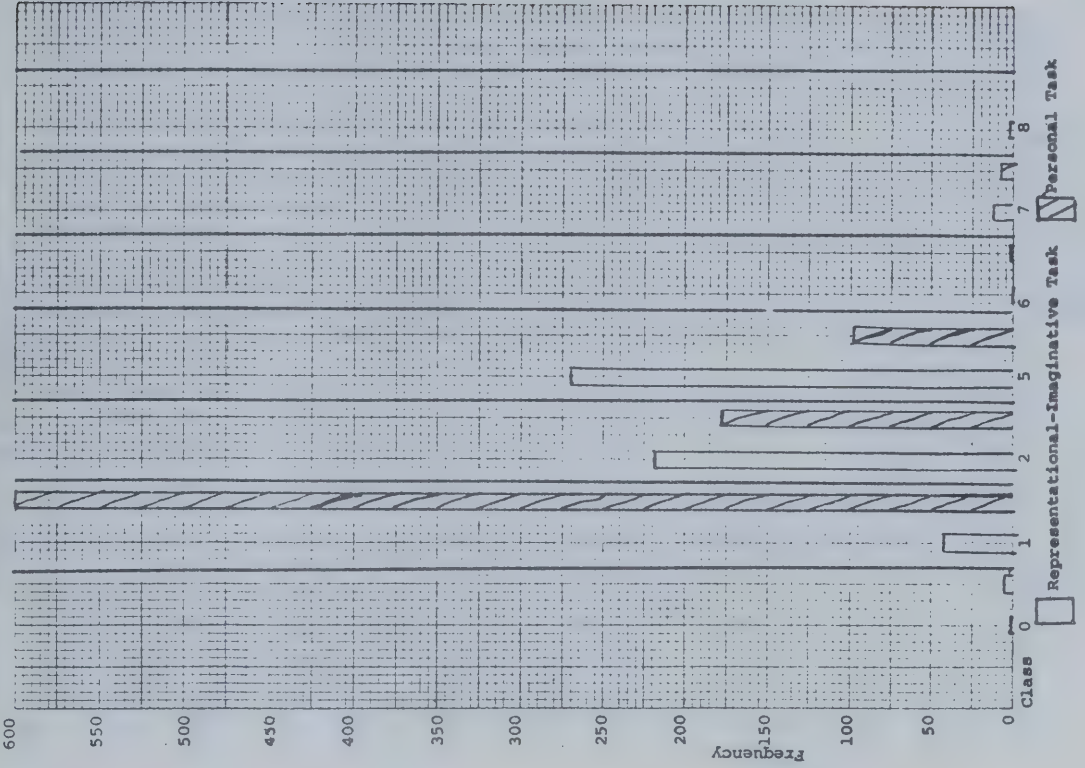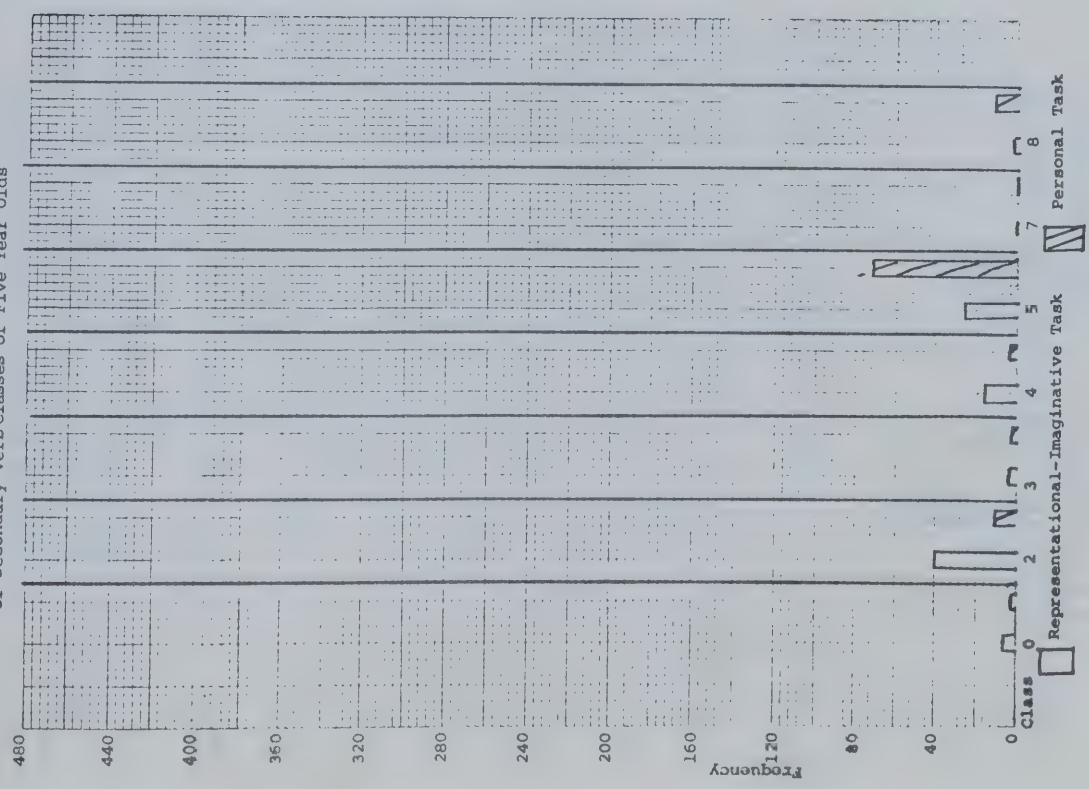

Figure 20. Representational-Imaginative and Personal Tasks: Frequency of Secondary Verb Classes of Seven Year Olds

Figure 22. Five and Seven Year Olds: Frequency of Secondary Verb Classes in Personal Task

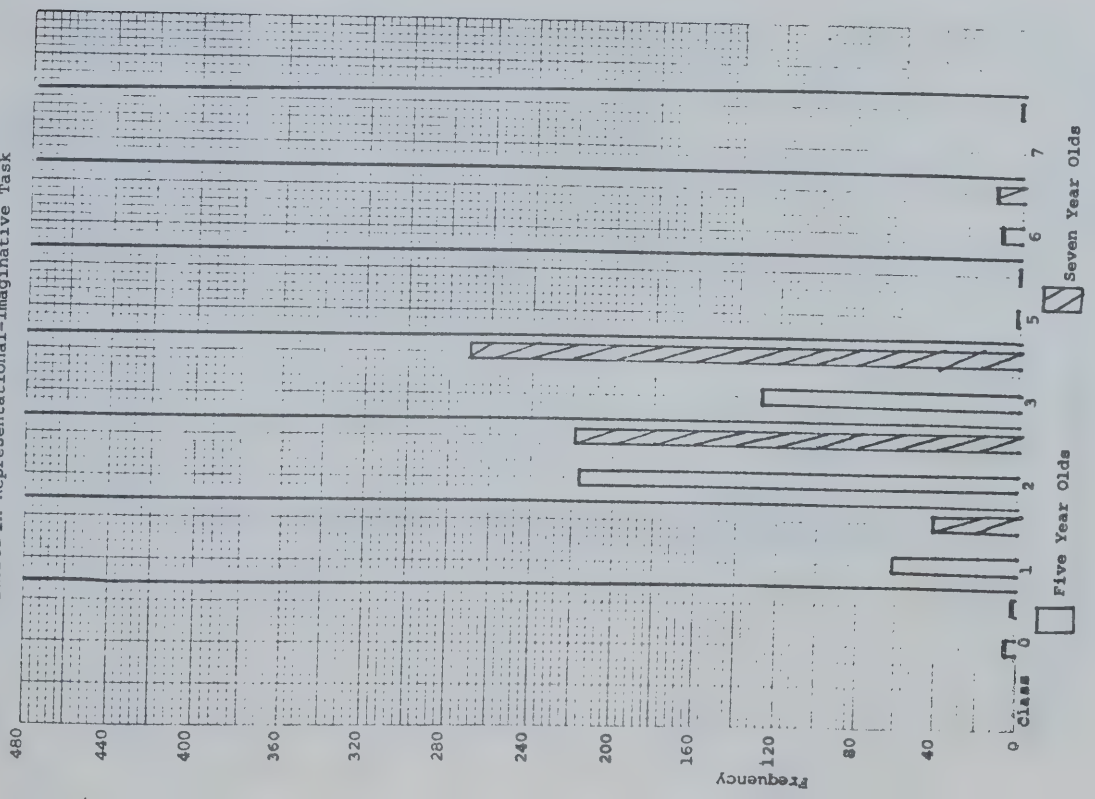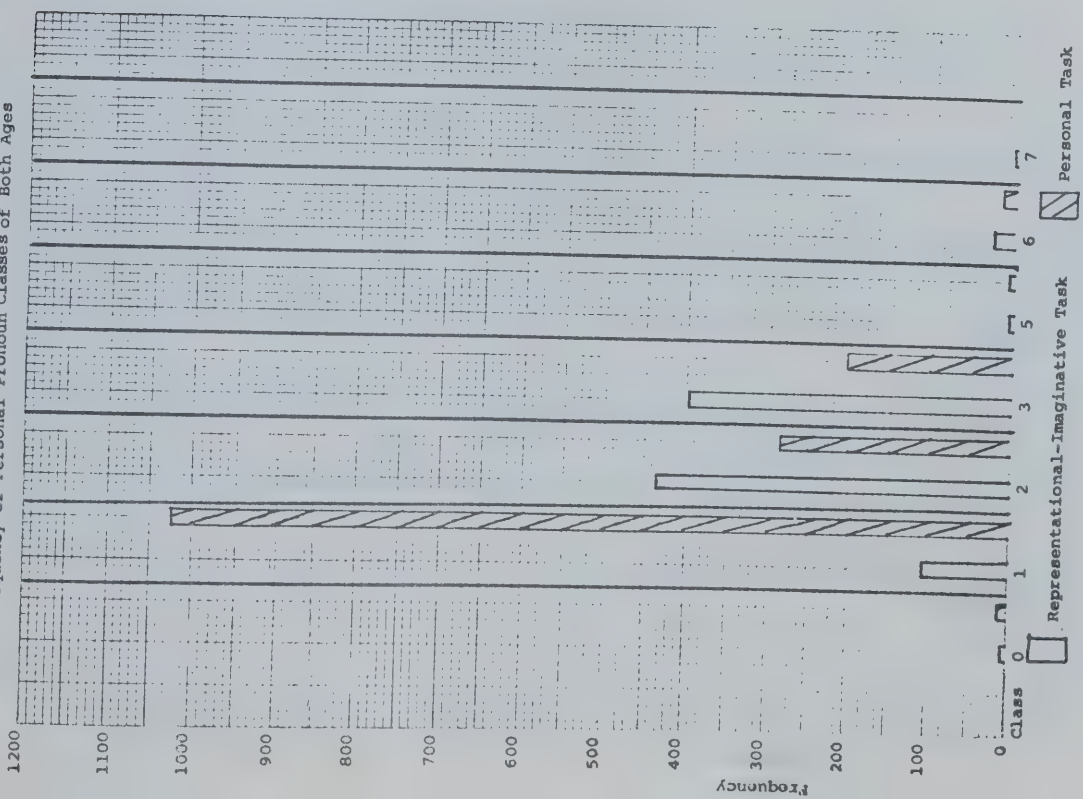Figure 21. Five and Seven Year Olds: Frequency of Secondary Verb Classes in Representational-Imaginative Task

Figure 24. Five and Seven Year Olds: Frequency of Secondary Verb Classes in Two Tasks

Figure 23. Representational-Imaginative and Personal Tasks: Frequency of Secondary Verb Classes of Both Ages
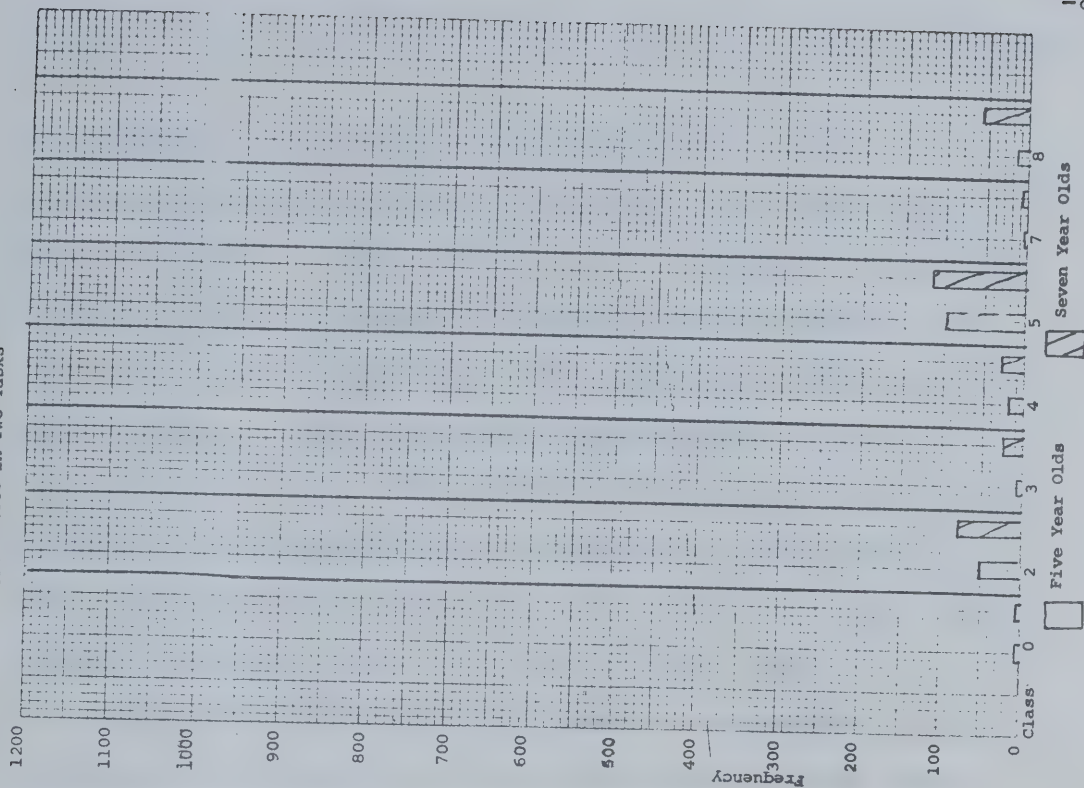
complements, "I want you to go. He tried to do",
obligatory deletions "Make it (to) go", and infinitives
with wh-words, "I know how to do it." The seven year olds
showed a higher frequency of gerunds in both tasks, such
as "They started fighting". Five year olds used very few
gerunds but did use the present participle, such as "I
see a boy running". The present participle was used more
often in the representational-imaginative task than in
the personal task by five year olds while seven year olds
showed the same frequency of use in both tasks.

Figures 25 through 30 represent the distributions of
complexity of negatives used by both ages in both tasks.
In the personal task, there is no difference in distri-
bution of frequencies of classes for the two ages. Like-
wise the seven year olds show no differences between the
two tasks. The five year olds, however, use the negatives
"can't and don't" most in the representational-imaginative
task while they use all negatives other than "can't, don't,
won't, isn't and it's not" most in the personal task.

Figures 31 through 36 compare the distributions of
frequency of possible conjunction classes by the two age
groups in the two tasks. No difference exists between the
age groups in the distribution of frequencies for either
task. In both age groups the most frequently used con-
junction in both tasks is "and". In the personal task,
use of high scoring conjunctions is considerably more than

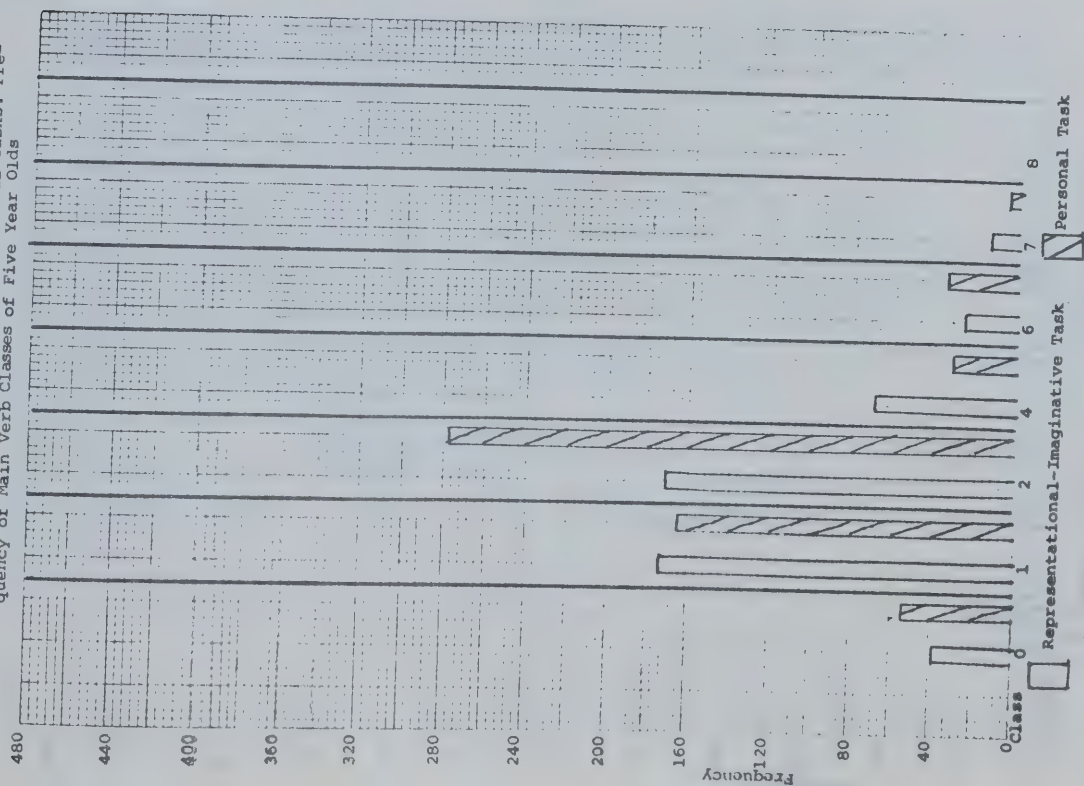Figure 26. Representational-Imaginative and Personal Tasks: Frequency of Negative Classes of Seven Year Olds

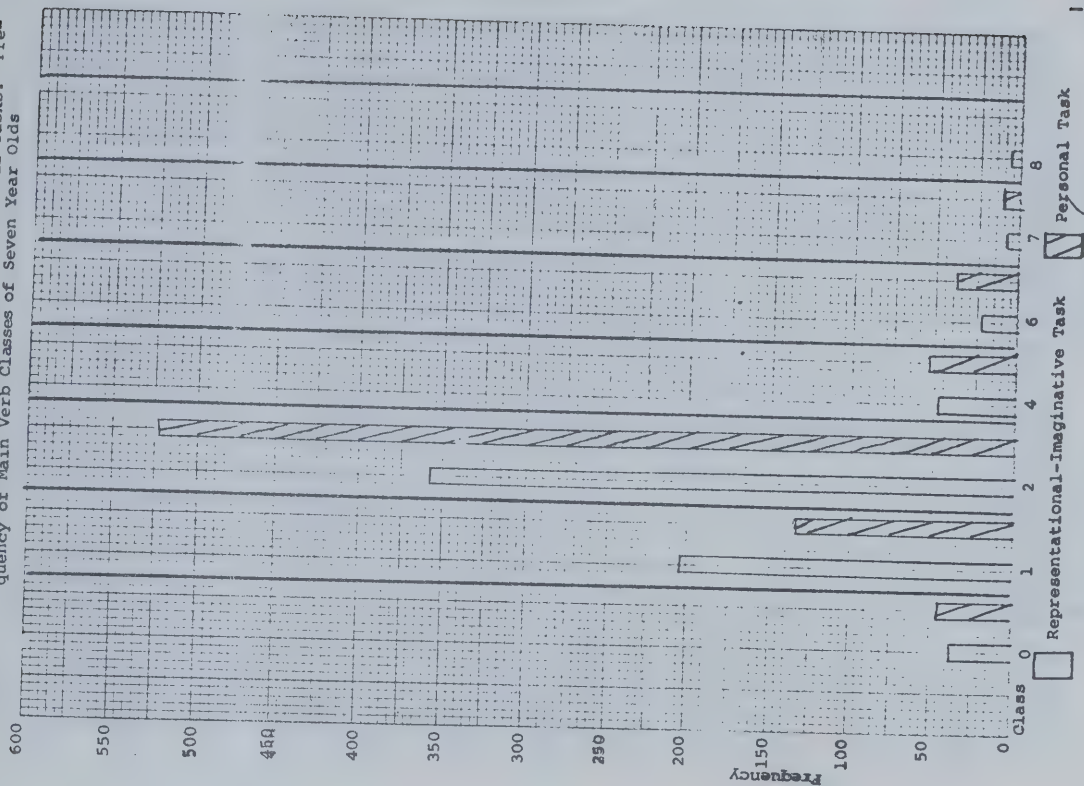Figure 25. Representational-Imaginative and Personal Tasks: Frequency of Negative Classes of Five Year Olds
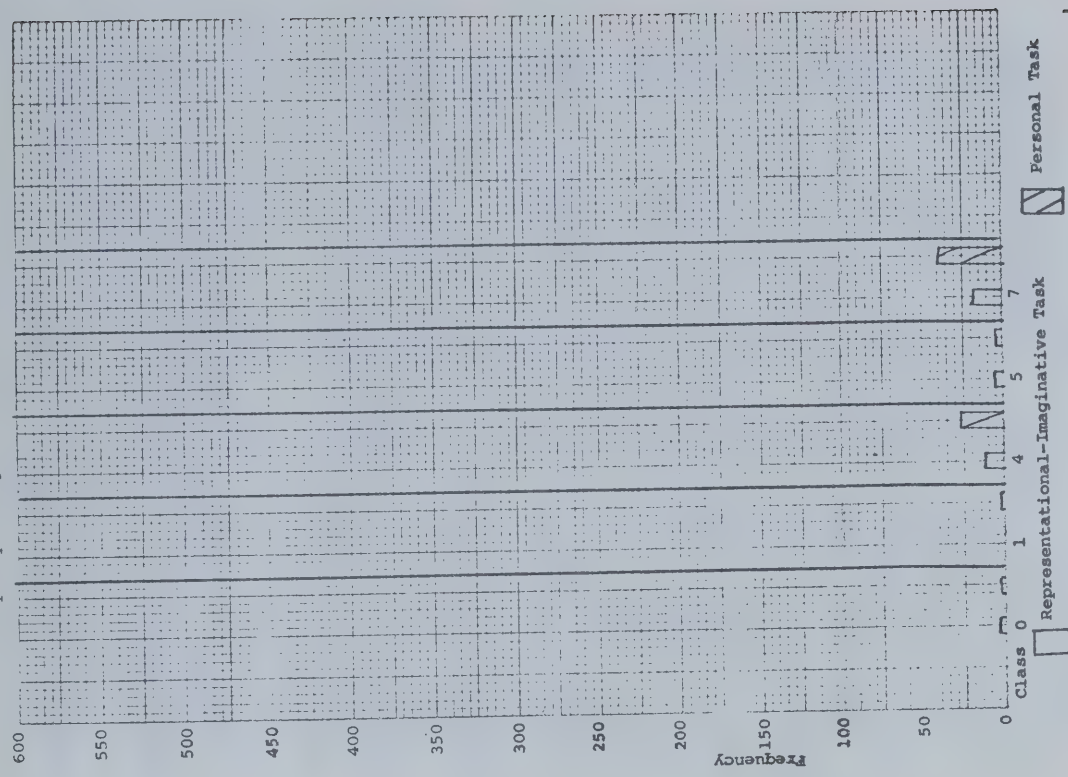
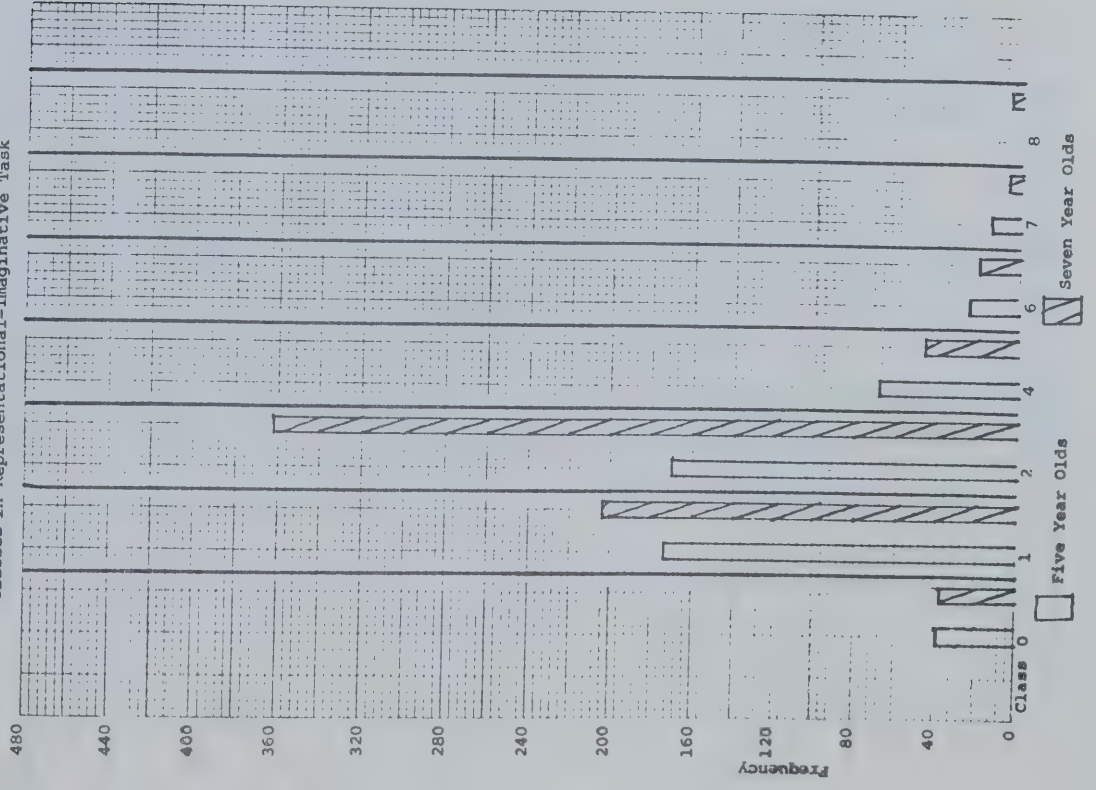Figure 27. Five and Seven Year Olds: Frequency of Negative Classes in Representational-Imaginative Task
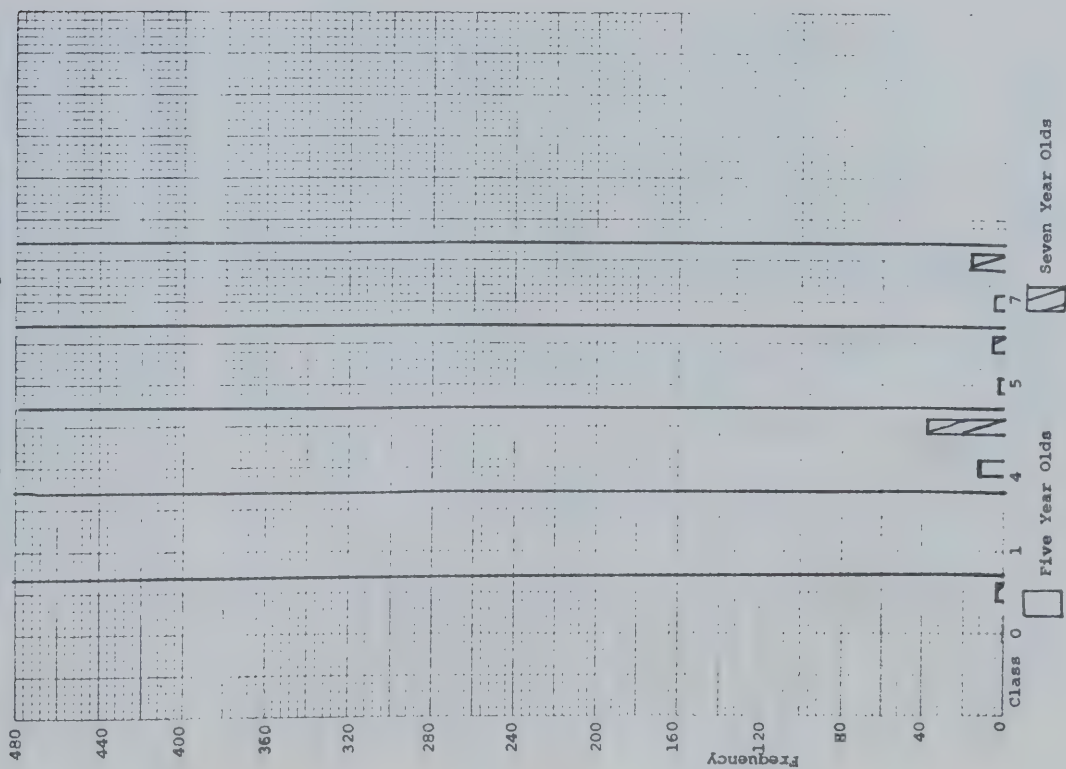
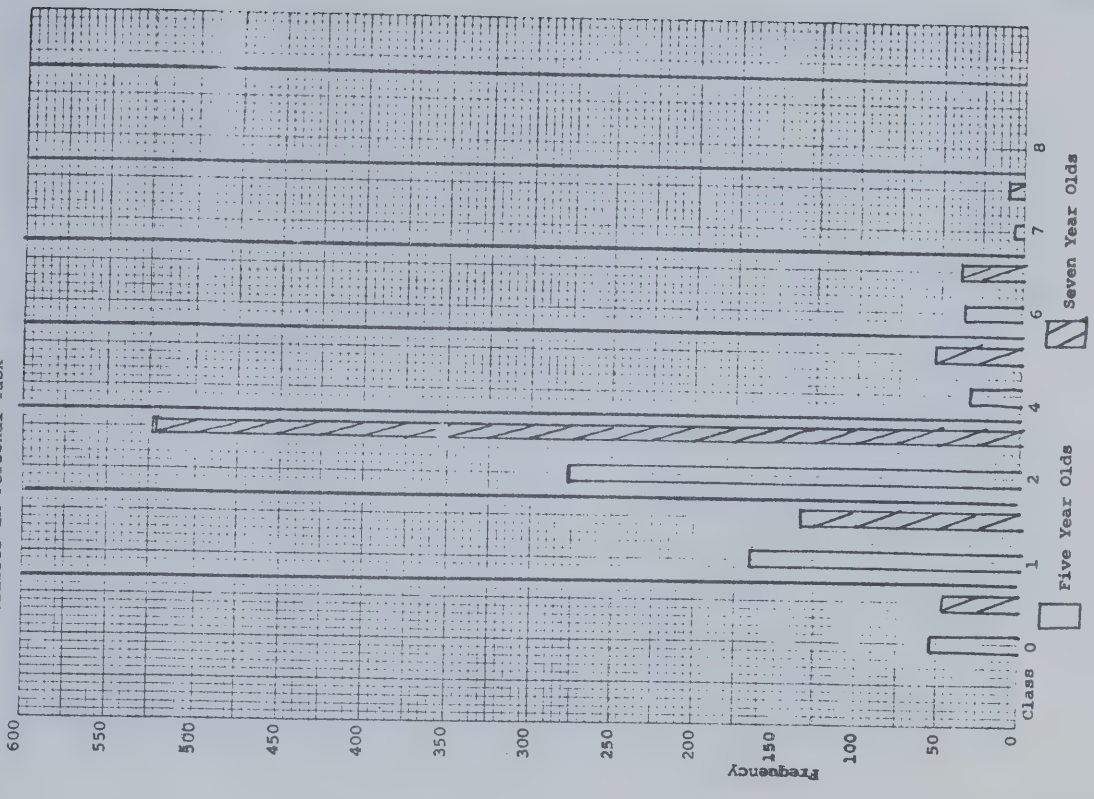Figure 28. Five and Seven Year Olds: Frequency of Negative Classes in Personal Task
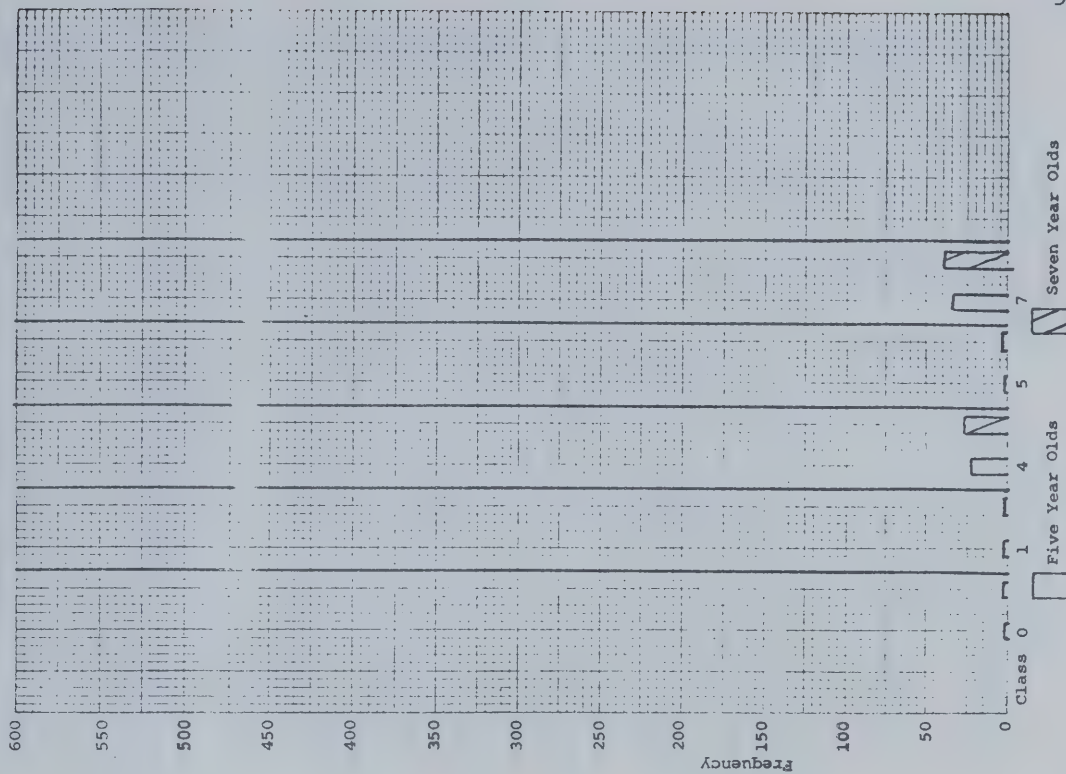
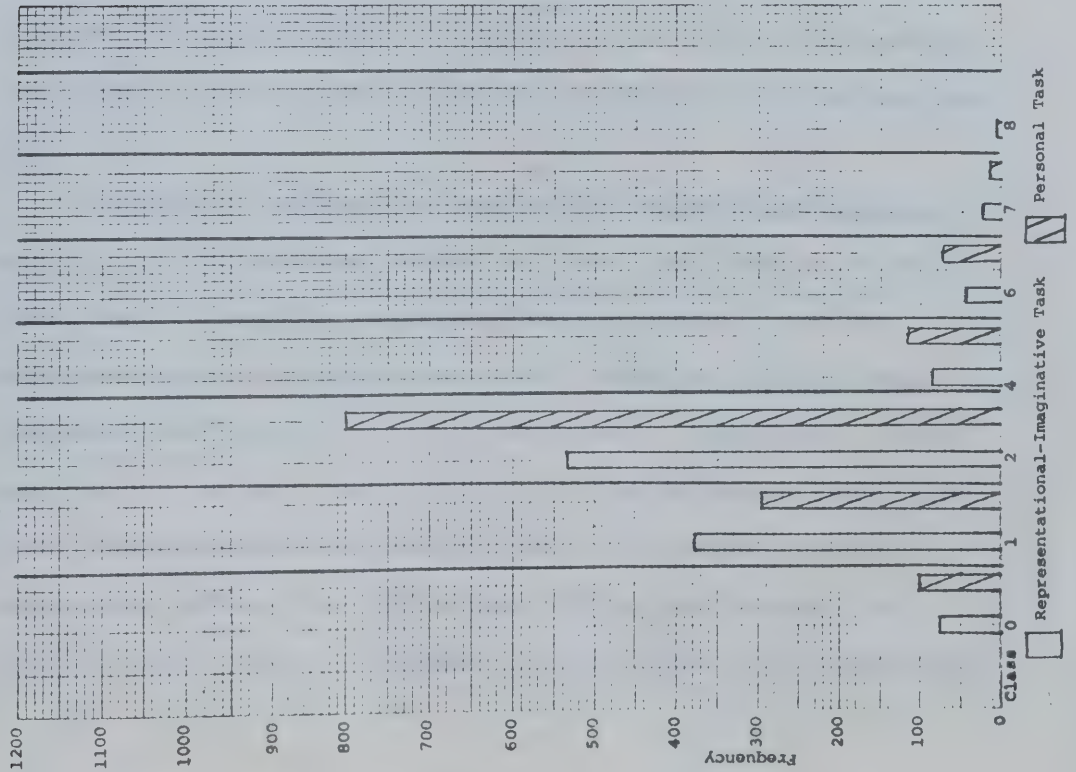Figure 29. Representational-Imaginative and Personal Tasks: Frequency of Negative Classes of Both Ages
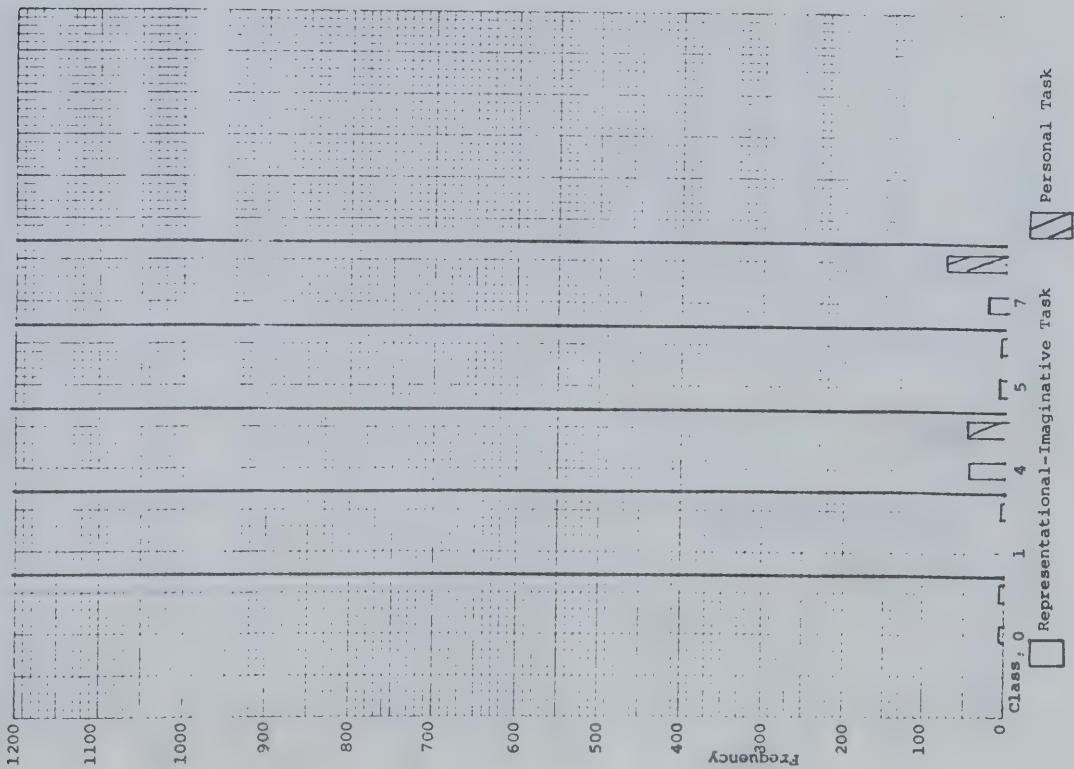
Figure 30. Five and Seven Year Olds: Frequency of Negative Classes in Two Tasks

Figure 32. Representational-Imaginative and Personal Tasks: Frequency of Conjunction Classes of Seven Year Olds

Figure 31. Representational-Imaginative and Personal Tasks: Frequency of Conjunction Classes of Five Year Olds
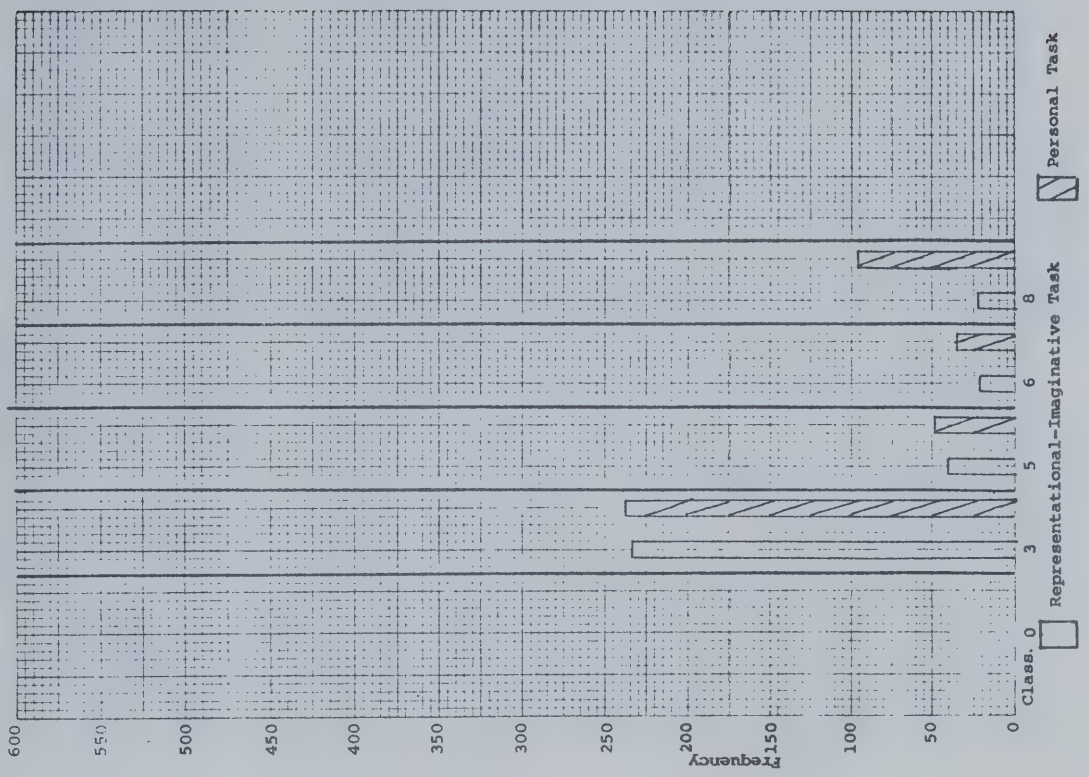
Figure 33. Five and Seven Year Olds: Frequency of Conjunction
Classes in Representational-Imaginative Task
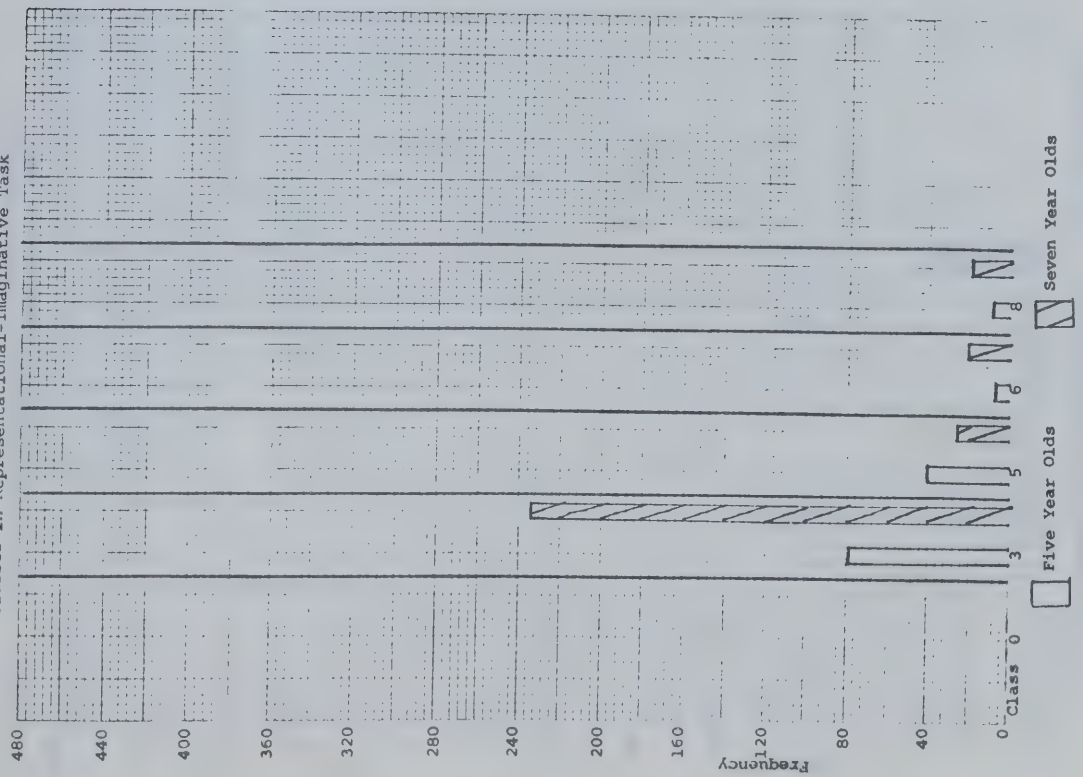
Figure 34. Five and Seven Year Olds: Frequency of Conjunction
Classes in Personal Task
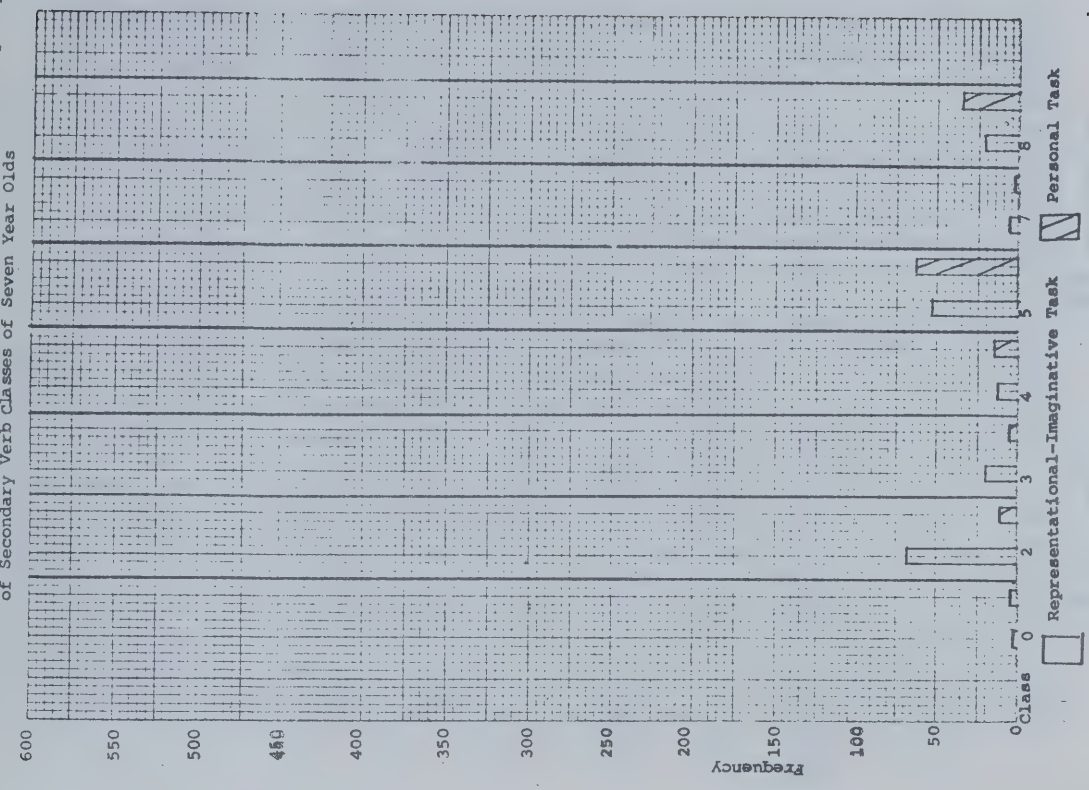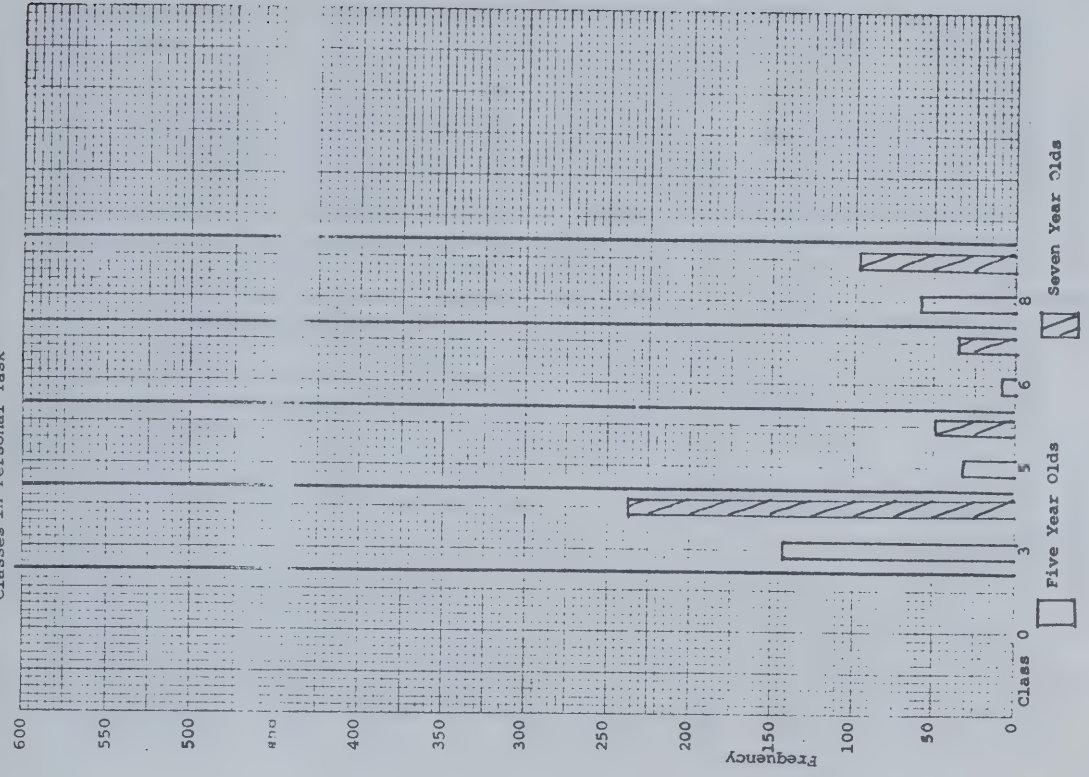
Figure 35. Representational-Imaginative and Personal Tasks:
Frequency of Conjunction Classes of Both Ages
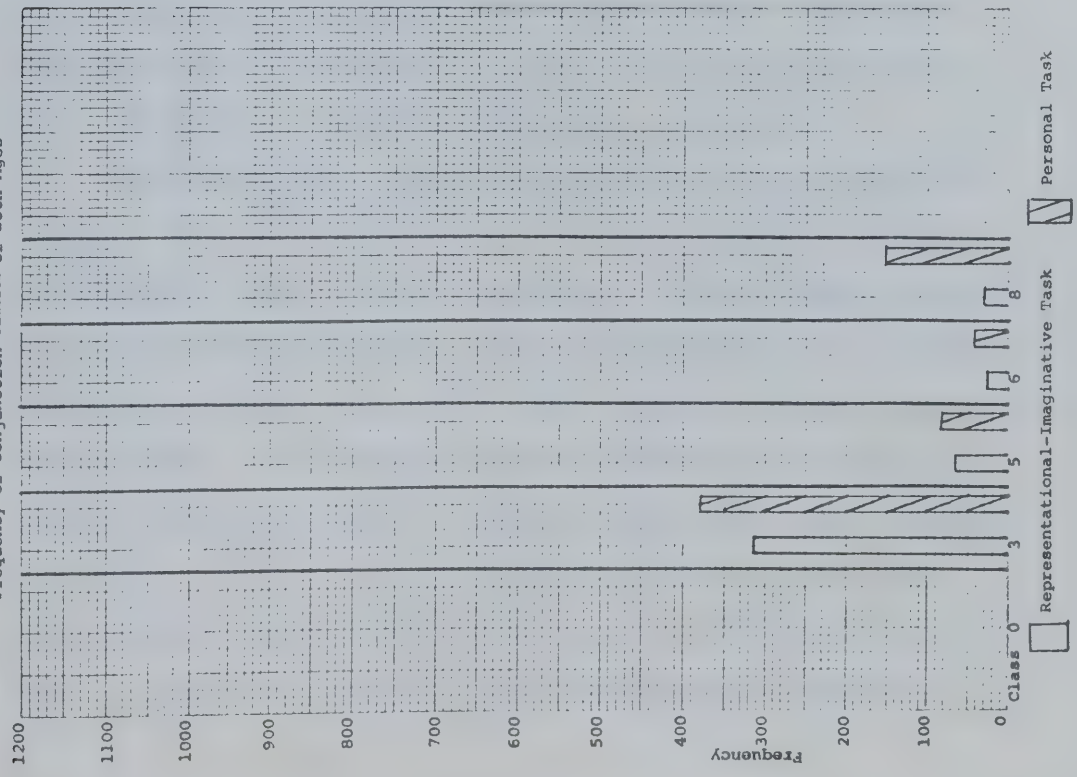
Figure 36. Five and Seven Year Olds: Frequency of Conjunction
Classes in Two Tasks
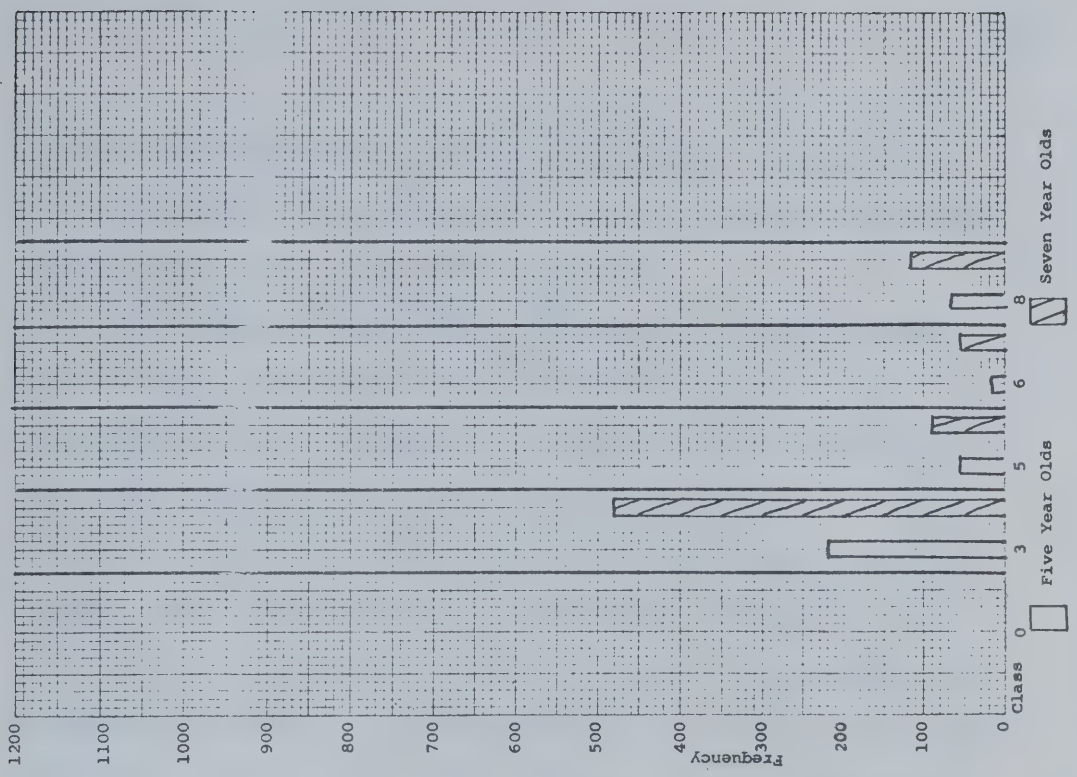
in the representational-imaginative task. Included in
this class of conjunctions are all subordinating conjunc-
tions except "so", "if" and "because".

In summary, significant differences exist between
the two age groups in overall linguistic complexity.
Specifically this difference is shown in a difference in
the distributions of various complexity levels for per-
sonal pronouns, secondary verbs and main verbs over both
tasks. One final source of difference between the two
ages is the difference in distribution of frequencies on
negative classes in the representational-imaginative task.
Otherwise, differences were revealed in the distribution
of individual mean indefinite pronoun, main verb, secon-
dary verb and conjunction scores about their respective
age group means with the five year old group displaying
more variability than the seven year old group.

The significant difference between the two tasks in
overall linguistic complexity has more specific instances
of disparity when further analyzed. The difference between
the mean personal pronoun scores implies that more complex
personal pronouns are used in the representational-imagin-
ative task. For both age groups, personal pronouns, main
verbs, secondary verbs and conjunctions occur with varying
distributions from task to task in terms of complexity.
As mentioned above, there also exists a difference between
the two tasks in regard to the distribution frequencies

of negative classes for five year olds. No difference was
revealed between the two tasks regarding indefinite pro-
nouns.

Analysis of Heuristic Task Results

Turning to the results of the heuristic task, analyses
are somewhat different. Of the boys involved in the study,
nineteen seven year olds and only seven five year olds
used the criterion level or more questions during the
heuristic task. Use of the measures of linguistic com-
plexity employed above was consequently abandoned in favor
of description of the types of questions asked. The
interrogative-reversal and wh-question components of DSS
were useful in this description. Table 18 summarizes the
mean frequency per interrogative-reversal class for the
two age groups in the heuristic task.

Table 18

Summary of the Mean Frequency for Interrogative-
Reversal Classes of Two Age Groups

Class	Age (Years)	
	5	7
0 voice inflection	2.954	1.684
1 reversal of copula	6.020	6.211
4 reversal of auxiliary be	1.009	0.000
6 reversal of obligatory do, modal, tag question	6.691	9.579
8 reversal of auxiliary have or 2-3 auxiliaries	0.000	0.000

Table 19 presents the mean frequency per wh-question class for the two age groups.

Table 19

Summary of the Mean Frequency of Wh-question
Classes for the Two Age Groups

Class	Age (Years)	
	5	7
2 who, what, what + noun, where, how many, how much, what ... do, what for	10.02	7.842
5 when, how, how + adjective	0.721	2.000
7 why, what if, how come, how about + gerund	2.834	1.526
8 whose, which, which + noun	0.000	0.105

The following null hypotheses were proposed:

1. The mean scores of a five year old group and a seven year old group for interrogative-reversals and wh-questions do not differ significantly in the heuristic task. $\bar{X}_5 = \bar{X}_7$ where X represents interrogative-reversal and wh-question scores, and 5 and 7 are ages.

2. For a five year old group and a seven year old group the distributions of frequencies of possible interrogative-reversal and wh-question classes do not differ significantly.

Neither of these null hypotheses were tested statistically due to insufficient data in the five year old group. Although no conclusive statements may be made with limited data, it appears that the five year olds use proportionately more rudimentary questions involving voice inflection and fewer questions involving reversal of

of obligatory "do" modals or tags than do seven year olds. Very few reversals of the auxiliaries "be" and "have" or of multiple auxiliaries were used by either group.

Among the wh-questions the lowest scoring group, predominantly "what", "what...do" and "what...for", was used most often by both groups. The five year olds appeared to use slightly more questions from this class and from the class involving "how come" than did seven year olds. The seven year olds seemed to use more questions involving "when", "how" and "how + adjective".

A closer analysis was made of questions asked during the other two tasks in order to determine whether the subjects would ask spontaneous questions during the representational-imaginative task and the personal task and whether questions posed during the heuristic task differed from questions asked during the other tasks. Considering the questions asked by subjects during other tasks reveals the mean scores for interrogative-reversals and wh-questions presented in Table 12.

These results appear to reinforce the proposal that the three tasks elicit different language from one another. The complexity level of questions seems higher in the heuristic task than in the other tasks. This may imply that the heuristic task elicits more complexity with regard to interrogative reversals and wh-questions, and therefore different language, than do the other two tasks. As above the representativeness of this statement with regards

Table 20

Mean Score for Interrogative-Reversals
and Wh-Questions in Three Tasks by Two
Age Groups

Task	5 years		7 years	
	Wh-Question Mean	Interrogative reversal Mean	Wh-Question Mean	Interrogative reversal Mean
Representational-imaginative	1.287	0.889	0.211	0.631
Personal	1.074	0.311	0.105	0.526
Heuristic	3.011	1.636	3.154	3.809

to the heuristic task remains highly tentative.

Looking directly at the questions themselves, it appears that the five year olds who asked any questions asked shorter and simpler questions than the seven year olds and used a high proportion of variants of "what is this/that/it/this thing?" Among the questions, though, there was great variation within the five year old age group.

These statements must be considered highly tentative particularly with regard to the five year olds. The overriding piece of information evolving from this task is that only 38.89 percent of the five year olds were able to produce seventeen or more different questions in response to the unfamiliar objects and requests presented.

This contrasts with 95.00 percent of the seven year olds who were able to accomplish the same task.

Summary of the Findings

(1) A significant difference exists between the five year old group and the seven year old group and between the personal task and the representational-imaginative task with regard to overall measures of linguistic complexity. The scores of the seven year old group and the personal task were the higher scores.

(2) No significant difference exists between the two age groups for the means of personal pronoun or negative scores when mean scores for six DSS component categories are analyzed. No further statements about the means of DSS component categories are possible because the age groups vary in terms of distribution of individual scores about the group mean scores.

(3) A significant difference exists between mean scores on the personal task and the representational-imaginative task for personal pronouns and negatives. When six component categories of DSS are analyzed, personal pronoun scores evidence interaction of age and task. No further statements about means of DSS component categories are possible because of lack of homogeneity of variance between the two age groups.

(4) The differences in distributions of each of main verb, secondary verb and personal pronoun classes are significant between the five and seven year old groups for

both tasks. The difference between age groups is signifi-
cant for distribution of frequencies of possible negative
classes in the representational-imaginative task. No
difference exists between the age groups for distribution
of frequencies of possible indefinite pronoun classes or
conjunction classes in both tasks, or for negative classes
in the personal task.

(5) There is a significant difference in the distri-
butions of frequencies of possible classes of all but
indefinite pronouns and negatives for both ages between
the personal task and the representational-imaginative
task. A significant difference also exists for negative
classes of five year olds between the personal task and the
representational-imaginative task.

(6) For the five year old group there is insufficient
data in the heuristic task to support any conclusion other
than one regarding the relatively few five year olds who
could ask sufficient questions to accomplish the task.

CHAPTER VI

Consideration must be given to the results of this study along several lines of discussion. It is important to ask what conclusions may be drawn from the results and why has the study given these results, what limitations are there inherent in the study, what recommendations can be made for further research, and finally, what implications for education arise from this study.

Conclusions

Overall measures of linguistic complexity (DSS, DSS of the five most complex sentences per task, DSS of the five most complex sentences per function, MLU and MLU of the five longest C-units per task), were found to differ between the two age groups. The finding is supported by review of literature (Loban, 1963, O'Donnell et al, 1967; Templin, 1957 and Koenigsnecht, 1974). Menyuk (1969, 151) reports that over the age range of four years to seven years, there is an increase in expansion of base structure nodes, in observation of syntactic properties and combinatorial rules of lexical items and in application of syntactic operations of addition, deletion, substitution and permutation to underlying sentences. These increases found by Menyuk (1969) might account for the differences observed in overall linguistic complexity between five and seven year olds.

Although no significant differences between age groups in mean DSS category scores were reported, differences between age groups were reported in distribution of frequency of possible classes for personal pronouns, main verbs, secondary verbs and negatives in at least one task. These differences in distribution of frequencies across complexity levels occur without significant differences in mean score between age groups. This implies that both five and seven year olds may be capable of producing approximately the same level of complexity but use the levels of complexity within each linguistic grouping to varying degrees. Support is again derived from Menyuk (1961) who states that all the basic structures employed in transformations of adult grammar can be found in the grammar of young children: ability to use these basic structures in an additive manner increases with age. The lack of significant difference between ages in distribution of frequencies of conjunction classes and indefinite pronoun classes, may indicate that for these linguistic structures the range of complexity used in these particular tasks is minimal.

The differences in variance of mean individual DSS category scores about their respective group means may be attributable to greater variability within the five year old group regarding mastery of main verbs, secondary verbs, indefinite pronouns and conjunctions. Menyuk states:

"Almost all the structures which are still in the process of being acquired at nursery-school level are also in this process at the first grade level" (1961, 71). Possibly this statement does not apply between kindergarten level and second grade level for the structures above. Consequently, variance within the five year old group is expected to be greater because this group is still in the process of mastering main verbs, secondary verbs, indefinite pronouns and conjunctions, whereas the seven year old group is at the stage of making only occasional errors (Berry, 1969). The reasons for homogeneity of variance between groups for personal pronouns and negatives may lie in the fact that both age groups have mastered these structures. This is indeed reported by Menyuk (1961, 56) in her comparison of usage of transformations by nursery-school and first grade children. Of a possible 48 children in each age group, all 48 were identified as using both pronoun and negation transformations. No direct comparison may be made with Koenigsnecht's (1974) or Lee and Canter's (1971) studies because the age groups differ from those in the present study; their division lines between age groups fall midway through the groups of the present study.

In addition to the differences between five and seven year olds, differences between the personal and representational-imaginative tasks were also found in DSS, DSS of

the five most complex sentences per task, DSS of the five
most complex sentences per function, MLU and MLU of the
five longest C-units per task. This supports the theoret-
ical position described in review of literature. Language
is seen as multifunctional. If the representational-
imaginative task and the personal task can be assumed to
elicit representational and imaginative language and per-
sonal language respectively, the language collected for
one task represents different functions from the language
collected in the second task. In addition to the consid-
eration that language serves many purposes, Halliday (1973)
proposes that each language function is reflected in the
nature of the grammatical organization itself. This
implies that differences in linguistic complexity observed
between the representational-imaginative language and the
personal language are expected by virtue of differences in
language function.

The direction of this difference favours the personal
language. This finding is supported by Cazden (1972b) who
suggests that greater emotion or greater personal involve-
ment in the topic of conversation is related to greater
complexity in language output.

No conclusive statements can be made about differences
in most mean DSS component category scores because of lack
of homogeneity of variance between the age groups. Differ-

ences in negative scores favouring the personal task may reflect the overall greater linguistic complexity.

Differences in mean DSS score for personal pronouns, however, favoured the representational-imaginative task and did so for the seven year old group more than for the five year old group. Considering the tasks themselves it is reasonable to expect the relation of personal experiences to include pronouns "I" and "we" more often than "he", "she", and "they". The reverse would be expected in story-telling and description. First and second person singular pronouns receive a score of 1 compared with a score of 2 for third person singular pronouns. As a result scores in the personal task are lower. Piaget (1926) describes the young child as egocentric. As evidenced by the greater difference for seven year olds between the tasks, it may be that seven year olds use a variety of personal pronouns in both tasks but differentiate between the functions involved by using first and second person pronouns more in the relation of personal experiences. The five year olds, in comparison, may not differentiate as well between functions and continue to use the egocentric class containing "I", "me", "my" and "mine" in both tasks. Consequently, the differences between scores for the two tasks are reduced.

The distributions of frequencies of classes within each DSS component category differed significantly from

one task to the second with the exception of indefinite pronouns. Reasons for the lack of differences between tasks in frequencies of indefinite pronoun classes may be related to Loban's (1963) finding that children use a great proportion of constructions involving "This ...", "It is ..." and "That is ...". The lack of difference between tasks on this measure may not be a general use of the above structures but rather, nondifferentiation in the necessity for a range of indefinite pronouns in the tasks of this study.

Differences in distribution of frequencies of classes in the remaining five DSS categories favour the personal task with the exception of the seven year olds showing no difference between tasks in frequency distribution of negative classes. As above, it may be that the two tasks required no difference in range of complexity of negatives. The classification of negatives is related to main verb classification; e.g. "don't" scores 4 while "didn't" scores 7. Although differences between tasks on distribution of frequency of main verb classes are significant for both age groups the scores appear more discrepant in the five year old group. This relationship between negative and main verb classification may help to account for the sig-nificance of the difference between tasks for five year olds' frequency distributions for negative classes. Over-

all, the distribution of frequency of classes per DSS cate-
gory reflect the general increased linguistic complexity
of the personal task as supported by Cazden (1972b).

No conclusions may be formed with regard to the
heuristic task except that the task did not elicit the
variety of questions necessary for analysis from the younger
age group. Judging from Cazden (1972b, 54) children as
young as 42-54 months are capable of a complete repertoire
of interrogative reversals and wh-questions. There there-
fore remains the strong probability that the task itself
was not appropriate. Since the heuristic task was framed
in metalinguistic terms it required that the child compre-
hend the meaning of "ask" and "question" and translate
these meanings into expression. Seven year olds were
capable of this task and there appears to be a greater
complexity of questions asked here compared with the ques-
tions of the other tasks. This, however, is speculation.
Beyond description of the actual questions posed no further
conclusions may be offered.

The present study has no study with which it may be
compared in terms of results elicited by the two specific
different tasks chosen, though these differences are suppor-
ted in theory by the findings of Yorke (1973) and by com-
parisons between studies (Loban, 1963, with O'Donnell et
al, 1967; and Strang and Hocker, 1965 with Strickland, 1962.

When mean DSS scores of the two age groups are compared with those reported by Koenigsnecht (1974, 230), a difference may exist favouring the subjects of the present study (see Table 21).

Table 21

___

Comparison of DSS in the Present Study
and in Koenigsnecht (1974)

___

| Koenigsnecht | | | Present Study | |
Age (Years-Months)	DSS	Age	Representational-Imaginative Task DSS	Personal Task DSS
4-0 to 4-11	8.04	4-9 to 5-3	10.17	13.40
5-0 to 5-11	9.19			
6-0 to 6-11	10.94	6-9 to 7-3	15.05	16.95

___

Within the limitations of making comparisons across different age groupings, the mean scores for DSS component categories of the present study appear highly similar to those of Koenigsnecht (1974). These scores are represented in Table 22.

As mentioned previously, no comparisons between mean scores for any of the above categories other than negatives or personal pronouns were possible because of lack of homogeneity of variance within age groups in the present study. Comparisons between studies are further restricted by differences in group composition.

Table 22

Comparison of Mean Scores for DSS Component
Categories in Two Studies

Component Category	Koenigsnecht, 1974			Present Study RI/P*	
	4-0 – 4-11	5-0 – 5-11	6-0 – 6-11	4-9 – 5-3	6-9 – 7-3
Indefinite Pronoun	1.93	2.12	2.20	2.08/1.0175	2.175/2.321
Personal Pronoun	2.07	2.06	2.09	2.266/1.509	2.533/1.475
Main Verb	1.98	2.62	2.10	2.112/1.950	2.533/2.034
Secondary Verb	3.33	3.34	3.27	3.143/4.416	3.970/4.955
Negative	5.14	4.92	5.22	3.819/4.644	4.228/5.228
Conjunction	3.71	3.94	3.72	3.367/4.549	3.542/4.509

* RI/P = scores are tabulated as mean for representational-
imaginative task/mean for personal task

Differences favouring the subjects of the present
study are brought to light when comparisons of MLU are made
with Loban (1963). Table 23 represents these comparisons.
MLU scores of the subjects of the present study are not
elevated when the scores obtained in other studies are
compared as well. Templin (1957), Winitz (1959) Minifie
et al (1963), and O'Donnell et al (1967) found MLU of
5.80, 5.39, 6.79, and 7.47 respectively for kindergarten

Table 23

Age	Loban (1963)	Present Study
5	4.18 (low group)	5.79 (representational-imaginative task)
	5.76 (high group)	6.67 (personal task)
7	5.49 (low group)	7.09 (representational-imaginative task)
	7.04 (high group)	7.85 (personal task)

children. O'Donnell et al (1967) found an MLU of 8.52 for

seven year olds.

The possibility of discrepancies between the subjects

of the present study and those of other studies should be

weighed carefully in terms of the compositions of the

groups compared and the tasks in which the language was

collected. Within the present study where the group compo-

sition was held constant, differences existed in linguistic

complexity from task to task. Would it not be reasonable

to expect difficulty in comparing studies where tasks

differ, particularly where groups of subjects differ as

well?

In summary, the results of this study cannot be

legitimately compared with those of other studies except

in terms of theoretical support. Until studies similar to

or replicating the present one are conducted, the conclusions
must be held as tentative ones.

Limitations of the Study

The findings of this study should be interpreted
within certain limitations. The following factors limit
the generalizability of this study: the selection of sub-
jects, the materials, the instructions, the size of samples
collected and the analysis procedure.

The subjects of this study were drawn from schools in
which they were enrolled in regular classrooms. They were
considered not to have speech and language problems. All
the boys of each grade were included; however, since no
measures of normalcy, other than teacher reports and grade
placement, were obtained, the composition of the groups
regarding language-related abilities was essentially un-
known.

The possibility that differences exist between the
subjects of the present study and the population of boys
aged 4-9 to 5-3 and 6-9 to 7-3 in regular classrooms of low
middle class districts should be considered.

It is also possible that discrepancies between DSS
scores of this study and scores of Koenigsnecht (1974)
reflect difficulties with the scoring instrument. As
reported by Longhurst and Schrandt (1973) regarding Lee
and Canter's (1971) DSS, some disagreement existed re-
garding what constituted a sentence. The 1974 revision

of DSS continues to use the sentence as a unit of measure-
ment. Disagreement regarding what constituted a sentence
may affect overall scores. In addition, Lee (1974) recom-
mends that DSS be calculated over fifty consecutive sen-
tences. Violation of this recommendation means that only
"a rather tentative DSS can . . . be derived" (Lee, 1974,
163). Furthermore, unequal samples of sentences prorating
also affect DSS as a result of the sample size.

Aside from limitations introduced by difficulties with
applying DSS, limitations to generalization of this study
are introduced by the use of this particular scoring sys-
tem. In addition to lits lack of explicit definition of a
sentence, DSS requires that all items scored meet require-
ments of a "sentence", namely subject and verb. This means
that shorter nonsentential utterances are completely dis-
regarded. Included as unscorable are not merely one word
responses but also complex noun and verb phrases: for
example, "got our hose and turned it on full blast", "must
have got hurt", and "like hitting our baby and breaking
things, and spitting in the house, and jumping when someone's
sleeping". Two five year olds who were eliminated from the
study for insufficient sentences actually gave twenty utter-
ances for each task, thus, language and consequently infor-
mation was lost. The personal and representational-imagin-
ative language samples of one child who was excluded from
the study are enclosed in Appendix J.

The criterion of sentence units, besides introducing confusion in defining sentences, may have eliminated lower linguistic complexity levels from the study. A further limitation imposed through use of DSS is the disregard of the conversational element. No credit is given for sen- tential connectives at the beginning of clauses, thus embedding through use of a subordinate conjunction is reduced in the sample. For example, the response "When we go to a hockey game or football game" was made to the instruction "Tell me about one time when you felt happy". This response received a total score of 9 composed of a score of 3 for the personal pronoun, a score of 1 for the main verb, a score of 5 for the conjunction "or" and no score for the conjunction "when". Had the conjunction score been given for the occurrence of "when" the total score would have been eight points higher. This would credit the subject for having used a connective in response to a speaker in conversation. The present system treats the utterance as if the child had not used the conjunction at all. Thus, further research and investigation of DSS (1974) is necessary to avoid limitations to the study of linguistic complexity introduced by the scoring system itself.

When the relationship of tasks to language function is considered, the present study is limited by the tasks employed. Collapsing the representational task and the

imaginative task into one task did not assure that both

functions of language were being used. The following

examples from five year olds illustrate this fact by

including representational language, or language used for

description and explanation, almost exclusively in two

of the samples:

Subject 1. This boy has snow boots. And it's
            winter outside. And this lady's
            wearing shoes. And this dog is
            wearing these number on his thing.
            And it's a car.
            He seems to have hair on him.
            Where are these from?

Subject 2. That's a dog. There's two children.
            Lookit they safety belt the dog.
            There's a mother.
            Looks like in a train or a car I
            think. Or a volkswagon. I donno.

Subject 3. And I know a really bad story that's
            against the rules. No dogs in the
            car. There's a dog in the car. The
            dog gets caught. Goes to the dog
            pound. It goes in a dog cage.
            It goes to Mars.

As with the representational-imaginative task, the

language function being tapped in the personal task is not

consistently the expression of feelings and attitudes but

more often a description of personal experiences surrounding

these feelings. The following example from one seven year

old illustrates this fact.

Like my mom said "Let's read", and I said, "No
I gotta go to sleep." And this is another one.
I got four. Like um like when I was just um
when I was just my mom said "Let's read two stories".
I said, "Nah, cuz I;m really tired and I had a big

day at school like we we we done a whole bunch
of sorts of things with my legs." And that
Ukrania.. she said, "Do some exercises for me
at Ukranian after Ukranian" cuz I'm a Ukranian
dancer. And then I said, "No my legs hurt and
I wanna go to bed." And my last one, like um
my brother he wanted me to tape something on
like this kind of tape recorder but it is that
it's that big . . . but it doesn't have all
those controls. Things are there and you just
go and that and that flip up. (And what happened?)
And I said, "No, Darrel, I'm really tired." Like
our cousins were over.

Both the personal task and the representational-
imaginative task include elements of the functions each
task was designed to elicit. However, more than one func-
tion is served by the language collected. Consequently,
the assumptions that the language of the personal task
is personal language and the language of the represen-
tational-imaginative is representational language and
imaginative language are not entirely founded. As a
result conclusions are restricted when relating back to
Halliday's (1969, 1973) models of language in terms of
multifunctionality or grammar expressed by function.

Regarding the heuristic task, all of the language
used in analysis was heuristic language, namely questions.
However, questions are not the sole expression of heuristic
language. Making hypotheses, tendering explanations, or
classifying outcomes were not included in the analyses.
Some of these other facets of heuristic language were, how-
ever, collected from the subjects during the heuristic
task. These examples are from one seven year old and one

five year old asking about an insole.

> Seven year old: Well you know I think . . . Won-
> der how they make all this fluff. Think I saw
> this stuff on the back before. Seems like it
> goes on a rug or something. Know it's mmmmm
> it's sticking out. Sticking out foomba, foomba,
> foomba. Oo scratchy. That feels funny. I
> wonder why it's so scratchy. I wonder what
> this is. Know what this looks like? That
> looks like thread. They stick all this on.
> Howcome it howcome it does not squirt out of
> the little wee tiny holes?

> Five year old: This these are very soft. What's
> that for? And what is this thing for? That
> makes it makes it soft. And then it can still
> turn. I know my boot one time it one time it. . .
> I like that turning around and like that like a
> pillow. Howcome it could twist like that? Then
> it's gonna break right off. Maybe it is maybe not.
> You can even put this just like a blanket. 'Cuz
> it's nice and stretch. Howcome the thread comes
> out? Yeah because you need then you have to
> have put a whole bunch of tape on it then it can't.

Conclusions based on analysis of questions alone cannot be generalized to heuristic language in general. The greatest limitation, however, was the fact that five year olds were often unable to do the task and resorted to description or refused to ask questions. The following is an example of a five year old who was requested to ask about an insole.

> That goes in shoes and stuff. An I think I don't
> know. My mom just didn't tell me how to get it.
> And we put our shoes on it. I got little shoes.
> That's all I know. But I don't know. I don't
> know what all of it. I don't know the rest of it.
> That's soft and and it could and I don't know the
> rest of it.

In this study, tasks were designed with Halliday's (1969, 1973) model as a basis. Consequently, the personal task was designed to ask children to relate personal experi-

ences and thus to produce first person pronouns. Simi-

larly the representational-imaginative task was designed

to ask children to relate past external happenings and

thus to produce past tense verbs and third person pronouns.

The heuristic task was designed to request children to ask

questions and thus to produce interrogative-reversals and

wh-questions. In total the tasks of this study are

designed to elicit specific linguistic components from

children. However, results indicated that subjects used

language for many functions even within the confines of

one task. The fact that language does vary in overall

complexity from task to task reveals that different func-

tions would be sampled in two separately designed tasks

than in a single task. It is necessary to avoid the

difficulty of describing language in terms of tasks which

ask for specific linguistic structures or components. This

necessity is recognized by Tough (1973a). It may be infor-

mative to describe an overall variety of tasks of separate

designs in terms of the functions of language identified

from the results collected per task.

Beyond the limitations imposed by the specific tasks,

general limitations of the study were introduced by the

probes and follow-up questions required in order to elicit

language. Tighter controls are necessary for extent of

probing even though there was an attempt to control the

type of probes. It is not valid to assume no subject-

examiner interaction influencing the number of probes given.
When boys gave short, single idea responses they were
followed by a probe. In many cases, this produced a set
for short single idea responses especially among the five
year olds. An example of this follows for a five year
old's representational-imaginative task:

> (What else is happening?) He's gonna punch him.
> (He's gonna punch him. That's what happens next.
> And then what happens?) Don't know. One kid's
> gonna hit him with that. (One kid's gonna hit
> him with that. And then what's going to happen?)
> I don't know. (Think.) Don't know. (One kid's
> gonna hit him with that and then?) One guy's
> gonna come running after him. (One guy's gonna
> come running after him. Then what happens?)
> Another one's gonna come running after him.
> (Oo that's a good story.) That one that one and
> that one. (That one that one and that one and
> what happens?) I don't know. (That one that one
> and that one come running after him and?) Gonna
> jump on him. (Good story.) And he's gonna jump
> on his back. (He's gonna jump on his back and
> then what happens?) He's gonna stomp on him.
> (He's gonna stomp on him, oh no.) He's gonna
> jump on him. (He's gonna jump on him.)

In addition to the task instructions and probes, some
limitations were introduced by the choice of materials. In
the representational-imaginative task, language was elicited
with respect to single pictures with one story per picture.
Though the pictures themselves were carefully chosen to
contain several familiar actions and characters, use of
pictures singly may have different effects on language
from those effects produced by the use of incomplete story
sequences in several pictures. The use of several pictures
controlling the amount of given information for represen-

tational language and required information for imaginative
language may elicit different output.

With regard to stimuli used in the personal task, two
of the Blacky Pictures tended to elicit the same category
of response, namely language related to anger. The follow-
ing is an example of responses of one five year old who
was eliminated from the study due to insufficient different
sentences in the personal task.

> (How does he feel inside?) Mad. (Have you ever
> felt mad?) Yeah. (Tell me about one time when
> you felt mad.) He made me mad. I punched him.
> (Tell me about it.) (What happened?) He punched
> me back. (Yeah. Tell me about that one time.)
> Nothing else. (Nothing else about that time?
> Tell me about a different time when you felt mad.)
> I punched a door down. (Oh, you punched a door
> down. Tell me about it.) And then the whole
> house broke down.

> (How does this dog feel inside?) Mad. (Mad.
> Have you ever felt mad like that?) Yes. (Yes.
> Tell me about it.) I have the first picture.
> (Tell me a little bit more about it this time.)
> (What makes you feel mad?) People punching me.
> (Tell me about one time when that happened.)
> (Tell me about somebody punching you.) Punch
> him back. Instead of punching him back, I could
> call the police. (Yeah you could call the police
> instead of punching him back. Tell me what else
> makes you feel mad?) What else makes you feel
> mad? One more thing.) (Tell me one more thing.)
> I can't.

The materials used in the heuristic task were suffic-
iently different from one another in function, shape and
texture to elicit a variety of questions. However, the
colour range was limited to black, silver and white with
blue and yellow on only one item (lipstick holder). In
addition only one item (meat thermometer) had discernible

component parts and consequently only that item had
movable parts. The effect of these limitations partic-
ularly on the five year olds' questions should be con-
sidered.

One final limitation involves the fact that all
samples were collected, transcribed and scored by the
experimenter. Although it standardizes data collection
to have a single examiner (Cowan, 1967), some examiner
bias is unavoidable if collection, transcription and
scoring are relegated to the experimenter alone. Inter-
rater reliability indicates that scoring is adequate;
however, possible examiner bias should not be overlooked
in collection and transcription of samples.

Recommendations for Further Research

If the same tasks and instructions are to be used,
further investigation is necessary for the materials used
as stimuli. Consideration should possibly be given to
the use of incomplete picture sequences in the represen-
tational-imaginative task. This would encourage the use
of imaginative language in completing the sequence and
representational language in describing the pictures and
explaining the action. Similarly, creation of parallel
pictures for the Blacky Pictures should be considered so
as to avoid the use of pictures potentially eliciting the
same or similar responses. A broader scope of vocabulary

of feelings and emotions would thereby be sampled. In
the heuristic task, colourful items with movable parts
may elicit more interest and more questions particularly
from the younger children.

Further investigation of the instructions themselves
is strongly recommended in order to compare more and less
effective instructions needed to sample a given language
function. For the representational-imaginative task, a
comparison between the present instructions and the
following may prove fruitful in terms of the imaginative
component of language: "Let's pretend (make believe)
something (else) happens in this picture. Pretend some-
thing happens next to make a story. You tell me the
story." A comparison of the present personal task and an
alternate task should be made with regard to actual
expression of feelings and relation of personal experi-
ences in terms of the subjects' emotional reaction.
Examples of alternate personal tasks include the following
instructions: "Have you ever come to school late/gone
to the zoo with your family/walked in a very dark place/
had a birthday party? Tell me how it made you feel." As
with the other tasks, comparison should be made between
the present heuristic task and alternate tasks regarding
language produced. One example of an alternate task follows:

> The examiner presents an unfamiliar occurrence
> before the child. This may be a simple chemical
> experiment where colours change or the substance
> gives off gas bubbles. Instructions are: "I am
> going to do something. Watch carefully. Talk
> to me about it."

The possibility of children asking questions spontaneously in this task may differ from the possibility of their asking questions when requested to do so.

Recommendations for analysis procedures in future research include the use of a semantic component or a description of word usage in terms of meaning. A possible measure for consideration would be Type Token Ratio (Siegel, 1967). A measure of linguistic complexity should also be used in analyzing data. With modifications regarding the unit of measurement, the requirement that only subject-verb combinations be scored, and the disregard for sentential conjunctions at the beginnings of clauses, DSS may still be a feasible instrument. However, further research is necessary in order to validate any modifications and in order to investigate possible changes in the weighting grid as a result of these modifications.

In addition to the above recommendations, a change in the blocks of data analyzed should be considered. Instead of merely analyzing the language by task, language should be analyzed by function. Although the DSS of the five most complex sentences per task and the DSS of the five most complex sentences per function are not appreciably different, the possibility that tasks contain many functions should be further investigated. For this purpose more than one classification system should be applied,

the most productive choices being Halliday (1969, 1973),

as in the present study, and Tough (1973a). Questions

asked in this proposed analysis are as follows:

> (1) What varieties of language functions are
>   identified per task?
>
> (2) What proportion of each task is identified
>   as a given function?
>
> (3) What differences exist between semantic
>   and syntactic measures of language identified
>   in each function?
>
> (4) Which classification system is most useful?

Analyzing the language in the above manner would serve to

standardize the blocks of language being compared in a

more valid manner than in the present study. The recom-

mended analysis would also allow for inclusion of all

utterances sampled in all tasks rather than selective

analysis as was necessary here.

With regard to the language samples themselves, a N

(age) X N (task) X 2(sex) design without repeated measures

could be considered. In this design, larger groups from

each age level could be assigned randomly to each task.

Normal distribution of linguistic skills throughout the

subjects is assumed. Another variable, sex, may also be

added to the study. With this design, a greater number

of units of language could be collected per subject with-

out introducing fatigue by requiring more than one task.

The greater the number of units for analysis and the

greater the number of subjects, the more valid will be the

measures and the conclusions based on these measures.

Implications for Education

With limitations of this study and recommendations for further research in mind, consideration should be given to the implications of this study for education. If there is a difference in linguistic complexity between the language representing the personal function and the language representing the representational-imaginative function, at least these two language functions should be an integral part of language programs. The present study reinforces the necessity of providing a pre-school environment in which the use of language is fostered (Cazden, 1972a, Tough, 1973a&b). The applications to language arts programming may be extended upwards into elementary school as well. Teaching may be aimed at facilitation of use of oral and written language in different functions and at expansion of grammatical or lexical abilities within this framework (Gleason, 1972; Elementary Language Arts Handbook, 1973, McFetridge, 1972). Adaptation and extension could be made of currently available elementary school language arts programs in order to include many functions of language (Fournier, 1969; Crosby, 1973; Allenson et al, 1973). The overall aim is to help the child learn to generate language for many functions.

Implications of this study may also be made to language assessment and remediation for children with dis-

ordered language. Generally, assessment involves child-
adult conversation without definite knowledge as to which
functions of language are being assessed. It is conceiv-
able, therefore, that a child may be assessed as language
disabled on the basis of his performance in one function
of language. Consequently, it is suggested that children's
language be assessed on several functions clearly defined
in terms of task. The differences in linguistic complex-
ity per language function could be of diagnostic signifi-
cance for remedial planning once research has progressed
to the point where comparisons among functions regarding
linguistic complexity have been normed.

In remediation of language disabilities, programs
should be planned taking language function into account.
For example, on the basis of the present research, it
would be advisable to plan the first stages in an expres-
sive language program under the representational-imagina-
tive function since linguistic complexity in this function
is simpler. It is important then to help the language
disabled child generalize and increase his linguistic
skills by introducing tasks in the personal function. One
example of such a program follows:

    1. To teach personal pronouns "him" and "her"
       begin by using cards with pictures of something
       happening to a boy or to a girl. e.g. "The
       dog is biting him. Mother is feeding her."
       Ask "What is happening?"

2. To teach the same personal pronouns use
cards with pictures of one central figure
"Tom" with obvious emotional expression
directed at a boy or a girl. e.g. "Tom is
angry with him. Tom is proud of her." Ask
"How does Tom feel?"

At the same time as accomplishing the objective of remedi-

ating a specific grammatical structure, the language dis-

abled child expands his repertoire of purposes for which

language may be used and syntax with which to use it.

Consideration should be given to adapting presently

available programs for language instruction to incorpor-

ate the functional aspect of language into the expressive

language learning situation. Peabody Lanuage Development

Kit (Dunn and Smith, 1966) emphasizes overall oral lang-

uage. Included in this program are thirty-six activities

in description (representational function), nine in drama-

tization, fourteen in make believe and thirty-two in

stories (imaginative function), forty-eight in following

directions (regulatory function), nine in guessing (heur-

istic function) as well as other activities combining

more than one function. Verbal Expression activities of

the MWM Program (Minskoff, Wiseman and Minskoff, 1972)

may also be extended as activities in language function.

Use of language skills for a variety of purposes would be

the logical carry-over technique for programs like the

DISTAR Language Program by Engelmann and Osborn (1970),

and programs developed by Guess, et al (in press); by

Yoder and Miller (1973), and by Bricker and Bricker (1970), which attempt to remediate below average language and communication skills through drill of those skills in a logical sequence.

In summary, there has been an attempt in this thesis project to design materials and instructions related to language function in order to answer the following question: does a child's level of language complexity vary with the function of his language? Despite the limitations of the study and the need for further investigation, some support accrues from this project for the position that language is multifunctional, and that, at least for the age groups and tasks examined, linguistic complexity varies with language function.

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Appendix A

Studies Recognizing the Multifunctional Character of Language

Study	Materials	Situation or Instructions	Population and number of Responses
Young, 1941	nursery school toys equipment, picture books, puzzles and pegboards	1. Outdoor—subject engaged in free play with chosen companions using toys and activities without adult supervision.	74 children aged 30 to 65 months enrolled in nursery school at University of Georgia.
			Sex and SES equally distributed.
		2. Indoor — record was made of responses during daily adult supervised routine in restricted play area.	
		3. Dinner — child conversed at table with one adult and four other children.	
		4. Pictures — child discussed picture books, puzzles and pegboards.	
		Assistants asked questions when necessary.	
Menyuk, 1963	The Blacky Pictures and play objects	1. Spontaneous speech responses to pictures.	48 private nursery children (3y 1m to 4y 4m) and 48 first

Appendix A Cont'd

Study	Materials	Situation or Instructions	Population and number of Responses
		2. A conversation with the experimenter generated by some of the questions suggested in the test manual and additional questions introduced by the experimenter.	grade children (5y 11m to 7y 1m) all had normal IQ, no physical disabilities impairing speech, and parental occupation in upper 24% of middle class. N= total responses
		3. Conversation with peers generated by role playing in a family setting. Instructions: "Pretend you've just gotten up in the morning and you're going to get ready for the day."	
Strang & Hocker, 1965	associated with situation	Parties, Sunday school, outdoor play, trips, at the movies, in the home, and in a first grade class of a public school.	First grade children. 2500 recorded samples of oral language.
Lee & Canter, 1971	1. A small barn and farm animals, a transport truck with removable cars, a doll family with some plastic doll furniture.	1. Children were invited to play with the toys and to talk about them.	160 children between the ages of 3y 0m and 6y 11m controlled for bilingualism, income, IQ, sex and age. N = 50 responses

Appendix A Cont'd

Study	Materials	Situation or Instructions	Population and number of Responses
	2. A set of pictures chosen from We Read Pictures, We Read More Pictures, and Before We Read.	2. They were next asked to tell about the pictures.	
	3. The Three Bears and pictures in What's Its Name?	3. They were finally asked to tell the story of The Three Bears.	
Yorke, 1973	1. Pictures of familiar animals, Old Mother Hubbard, Mother hanging out the laundry, a familiar masquerader, a new year activity.	1. Individual subjects made up a story about a picture he selected to his four peers in the presence of the investigator.	25 children in St. Lucia aged 4½years to 5y 4m.
	2. An ice skate.	2. Individual subjects asked questions about an unfamiliar object.	
		3. Individual subjects talked with an older sibling on a topic or topics of their choice.	

Appendix B

Studies Utilizing Informal, Unstructured Language Collection Devices

Study	Materials	Situation or Instructions	Population and number of Responses
McCarthy, 1930	a red auto, a squeaking cat, a telephone with a bell, a tin mouse, a music box, a small ball. Picture Books (animals, Mother Goose).	Child was addressed as little as possible in an effort to stimulate conversation. Language was collected at home or in day Nurseries.	140 children, 20 at each six month age level from 18 to 54 months. SES proportioned to population. Mean IQ over 100. N= 50 consecutive verbal responses.
Day, 1932	see McCarthy, (1930)	see McCarthy, (1930)	80 pairs of male and female twins, 20 at each year level from 2 to 5. N = 50.
Davis, 1937a	A collection of little covered wagons, with detachable oxen, lassoing cowboys, buffalo hunters, scouts, Indians in attitudes of hostility, flight or pursuit, and various animals and trees. Picture books.	The examiner framed her remarks in such a way as to stimulate conversation, saying "I wonder what you play with at home?" "Now, I'm going to show you something funny" or "Now, we're going to look at some books. I want you to tell me all about the pictures." For	436 children

Appendix B Cont'd

Study	Materials	Situation or Instructions	Population and number of Responses
		older groups, instructions were, "I want you to take these toys out of the boxes and play with them any way you like, just as you would if you were at home by yourself. But you must tell me just what you are doing while you play, so I will know."	
Templin, 1957	See McCarthy (1930)	See McCarthy (1930)	480 subjects, 60 at each of the following ages: 3, 3-5, 4-0, 4-5, 5-0, 6-0, 7-0 & 8-0 years. Attempted to control age, sex, IQ, family constellation, language spoken at home, bilingualiam, twinning and defective hearing.
			N = 50.
Strickland, 1962	Figurines of familiar story book characters ranging, depending on age of the subjects, from Mistress Mary and Red Riding Hood to Alice in Wonderland, Tom Sawyer and Paul Bunyon.	Children were recorded in groups of two or three. They were stimulated to talk about themselves, their families, pets or whatever was of common interest at the moment. As talk progressed, the interviewer asked question or made	575 children in grades 1 through 6 randomly sampled from 16 public schools. Only MR children were excluded. 100 children were selected at each age. N= 25 phonological units.

Appendix B Cont'd

Study	Materials	Situation or Instructions	Population and number of Responses
		comments only when necessary to keep the conversation flowing. The story book figurines served as primers on occasion.	
Young, 1941	See Appendix A	See Appendix A	See Appendix A
Strang & Hocker, 1965	See Appendix A	See Appendix A	See Appendix A

Appendix C

Studies Involving Description and Explanation Related to Pictures and Toys

Study	Materials	Situation or Instructions	Population and number of Responses
Winitz, 1959	Children's Appercep-tion Test Cards	Examiner engaged the child in conversation with neutral comments about the picture and the request "Tell me about this picture." The sample was collected in the child's home.	150 kindergarten en-trants who were phys-ically normal, white, monolinguals with normal IQ, speech and hearing. N= 50.
Loban, 1963	Six pictures	Children were asked what they saw in each picture and what they thought about each picture.	338 subjects drawn from 11 kindergar-tens stratified on the basis of sex, racial background and intellectual ability. N= total output
Cowan, 1967	10 5" x 7" pictures taken from magazine covers and mounted on coloured card-board.	The following instructions were given: "Tell me what they are doing and what is happening in the picture", or "Tell me what you see in the picture."	96 children matched for sex and SES from age 5 to 11 years. N= 50.
Menyuk, 1963	See Appendix A	See Appendix A	See Appendix A
Lee and Canter, 1971	See Appendix A	See Appendix A	See Appendix A

Appendix D

Studies Involving Story-telling in the Collection of Language Samples

Study	Materials	Situation or Instructions	Population and Number of Responses
Minifie et al, 1963	Children's Apperception Test Cards plus a second and third set of cards both examiner constructed.	Child was ecnouraged to "Tell a story about the picture." Further conversation was stimulated by asking "What is happening in this picture?" Sampling was collected in the child's own home.	One group of 48 5y 5m old children and one group of 48 8y 0m old children selected on the basis of sex, intelligence, SES, hearing, physical status and language background. N= 50 verbal responses on three occasions
O'Donnell et al, 1967	Two films, The Ant and the Dove and The North Wind and the Sun	After viewing two films the subjects were asked to respond by telling the story and answering pre-planned questions.	30 subjects at each level, kindergarten and grades 1,2,3,5,& 7. Control for sex. N= total output.
Anderson, 1972	Four black and white pictures and two film strips.	Children were asked to tell the story that each picture brought to their minds. Then each film strip was shown twice, first to allow the subjects to think about the total story; the second time the story was told.	29 children aged 9y 5m to 11y 4m. N= 50.

Appendix D Cont'd

Study	Materials	Situation or Instructions	Population and Number of Responses
Hass & Wepman, 1973	Thematic Appercep-tion Test Cards.	Story-telling technique was illustrated with as much prompting and modeling as necessary. The examiner then gave only open ended questions to secure a story.	30 middle-class chil-dren with no hearing loss, uncorrected visual problems, emo-tional disturbance or retardation were sel-ected from each age level 5, 6, 7, 9, 11, and 13 years.
Lee & Canter, 1971	See Appendix A	See Appendix A, Task 3	See Appendix A
Yorke, 1973	See Appendix A	See Appendix A, Task 1	See Appendix A

Appendix E

Studies Utilizing Question Asking in Collection of Children's Language

Study	Materials	Situation and Instructions	Population and Number of Responses
Robinson and Arnold, 1972	1. Toy cash register	The child was seen with his mother. 1. Instructions to the child: "I've got a toy here that I want you to play with and I want you to ask as many questions as you can about it. I want you to play with it with your Mum and ask her anything you like about it, say anything you like about it. Play with it in any way you like." Instructions of the mother were: "Can you play with him/her and answer any questions he/she asks? Play with him and help him in any way you like."	40 six-year old children and their mothers from middle and working class homes.
	2. Six pairs of objects one familiar and one unfamiliar. a) banana and avocado b) football rattle and African drum	2. Instructions to child were, "Now I've got some objects here and I'm going to show them to you two at a time. Some of them you might have seen before and	

Appendix E Cont'd

Study	Materials	Situation and Instructions	Population and Number of Responses
	c) Cheddar cheese and Emmental d) Conker and cedar cone e) tin of baked beans and tin of Chinese bean sprouts f) Egg-timer (sand) and pinger (clockwork cooking timer).	some of them may be strange to you. I want you to ask any questions you can about them, and say anything you like about them. Here are the first two, see if you can ask any questions about them." Mothers were asked to answer questions and help in any way they liked. Prompts allowed were: "What does it look like? Is it like the pears you have at home (for avocado)? How is it different?"	
3. Set of 10 questions.		3. I've got a list of questions here that children of your age have asked their mothers. Their mothers told me about them and said some were rather difficult to answer. I'm going to ask you the questions and see if you know an answer. If you don't you can ask your Mum."	
4. Picture of nursery rhyme-land depicting 9 nursery rhymes.		Instructions to child, "I've got a picture here that I'm going to show you. I want	

Appendix E Cont'd

Study	Materials	Situation or Instructions	Population and Number of Responses
		you to ask any questions you can about it or say anything about it that you like. Is there anything you want to know?"	
	5. Bingo Cards and family allowance book.	These items were placed successively on the table and the child was invited to say what he knew about each and to ask any questions he had. Mothers were asked to answer questions and explain the use of each item.	
Yorke, 1973	See Appendix A	See Appendix A, Task 2	See Appendix A

Appendix F

Modifications to M.L.U. Scoring

1. Treat "So" utterances as two utterances, e.g.

    We had to go/so we went.

    When I was little I said "Mom I wanna play inside"/ so I sneaked outside one day when they were sleeping.

    Sometimes my sisters wouldn't let me play some games/so then that makes me mad.

    That chain hurts him/so he's trying to get it off.

    We it was my brother's birthday/(and) and I always wanted it to be mine/and so then I finally learned that it's not nice to be jealous 'cuz you don't want to feel bad or that.

2. Consider "yes" and "no" as interjections which do not count e.g.,

    (Yeah) it is white.

    (Yes) and it is there.

    (Yes) but it does have legs.

3. Segment compound-complex sentences as two utterances or more joined by "and", e.g.,

    When I felt tired when I went to a to a choo choo train/and walking walking on the bus/and go on the bus/and go on the next bus/ and go on the next bus.

    When my brother Ed got my comic book/(and he three) and he put it all over in my clothes.

    I was angry when I got my new bike/and the handle-bars were bent/and the two tires were popped/and the seat was too high.

    When somebody wants this thing that I have/(and they) and they took it, but when I when I wanted it.

    And (why) why this is like that/and it's like this on the other side.

> When my brother sneaks up on me every night/and
> I see him/and I konk him on the head/so he can
> get back to sleep.

4. Segment utterances with the sentential connector "or"

    as separate units, e.g.,

    > And maybe somebody hit it in the air/or he just
    > didn't get it/or he threw it/and it busted.

5. Embedded sentences such as the following are treated as

    mazes, e.g.

    > I don't know what it was, but MaryAnne and Cory
    > our friends (well Mary Anne's my sister and Cory's
    > her friend) they were clowns.

6. Count "gonna", "wanna" and the like as one word, e.g.,

    > He was gonna go but I don't wanna.

Appendix G

Scored Example for M.L.U.

The first numeral above each C-unit indicates the number of that C-unit in sequence for each stimulus item. The second numeral represents MLU.

(I've got three pictures here. We're going to talk about all three of them. You pick the one you want to talk about first.)

This one.

(This one? Okay, tell me all about this picture. Tell me what's happening. Make up a story.)

```
          (1)            5                (2)      6
/These two boys are fighting. / That's what they're doing.  /
```

```
          (3)            8                    (4)
These guys are running over to these guys. / They might be
```

```
      5                (5)    5
play fighting. / I think they're not. /
```

(You think they're not?)

```
      (6)        5
/ Doesn't look like it. /
```

(Tell me some more about your story, Roger.)

```
          (7)            6                maze
/ Hey, I never seen that colour / all these [all of those]
```

colours of hair. I never saw those. Funny shirt.

(Tell me some more.)

Kids see they're running. Maybe they're they're trying to stop 'em or something. All these kids round here that are trying to run are prob'ly trying to stop 'em.

Appendix G Cont'd

(Mm, tell me some more about your story. What do you think

happened before this? Probably?)

Something happened they they he wrecked one of his things

and now they started fighting.

(He wrecked one of his things and then he started fighting.)

And then they both started fighting.

(What's going to happen next Roger?)

Maybe see a few a few minutes ago they probably will stop

fighting.

(Which picture do you pick next? Tell me all about this

picture. Tell me what's happening. Make up a story.)

                    maze   (1)
/ Let's say [they're they the the] the something is straight-

                          13
ening the baby and buckling him up. / Also [the] these two

(2)   8   (3)
guys they're all buckling. / And the dog is either smiling

     8   (4)
I think. / And wonder what these two handles are doing up

    10
there. /

(Tell me some more about your story.)

               (5)   7   (6)
/ What are these handles for the seatbelt? / they probably
                       8
go over there and over there. /

(Maybe. What's going to happen next?)

                   (7)   11
/ They're probably gonna go for a drive or something. /

. . .

Appendix G Cont'd

It's winter outside. Maybe ah lessee maybe they go for a
drive and going somewhere going skiing or somewhere.
(M, maybe)
Well they could be goin' ah to their Auntie's or somewhere.
(And what do you think happened before this?)
They were in their in that house. And they were just think-
ing about going for a drive. And . . . now they're going
there to skiing or somewhere.

(Tell me all about this picture. Tell me what's happening.
Make up a story.)

      maze   (1)   5
Let's say this boy is see the boy is crying. / Probably
(2)   10
he's crying because this little plane that broke. / See,
   (3)   6   (4)   8
here's part of it. / And look there's the rest of it. /
        (5)   5   (6) 1
And it's broken off. / See. / And you see he probably liked
that plane, probably his best toy he had.
(What's going to happen next?)
He's probably going to get a new plane.
(Mm. What happened before this?)
Well maybe he was throwing it around . . . And it went wang
and it probably crashed.

Appendix H

Supplementary Scoring Modifications for DSS (Lee, 1975)

1. In scoring compound verbs, give both verbs the same score even when some of the auxiliaries are deleted.

   <pre>
      2   1   1
   He is sitting and (is) waiting.
   </pre>

2. It always scores 1.

3. Then does not score. If a child says and then, the and scores 3. He receives a sentence point even if the and is omitted. Then is considered an adverb, not a conjunction.

4. Also is not scored. It is considered an adverb, like too.

5. Like receives a score of 8, no matter how it is used, even in the phrase like this. Semantically, the child is comparing two things; therefore, there are two basic sentences involved. This often seems to give a child too much credit, especially when the second sentence is demonstrated by gestures, as often happens when he says like this. But to avoid too much interpretation by the examiner, we decided to score like as 8 whenever it appeared.

6. The conjunction that is not scored unless it is spoken. The sentence is correct either way and receives a sentence point. Children at first leave it out. Later, when they include it, it scores 8.

Appendix H Cont'd

7. In cases of verb disagreement, count the first one cor-
    rect and the second one as an error. We made exceptions
    for this when a child was looking at a sequence of pic-
    tures. Here he could say, "The cat drank her milk and
    she goes away," if he were looking at two different pic-
    tures in the sequence. This often happened. But in
    storytelling, we did not allow the tense change because
    the pictures were not directing the child's formulation.

8. Infinitives are hard to explain and require many examples.
    I must refer you to the book for this, pp. 47-52.

9. I don't recall a rule for scoring the but in Yes, but I
    want to do it. Let's make up a rule: score it 5 on the
    basis that yes represents a sentence and but fulfills its
    conjoining function.

10. The corpus for DSS is 50 complete, different, intelligible,
    nonecholalic sentences. "Complete" means both subject
    and verb are present. Imperative sentences are included
    even though the subject is omitted. It would be possible
    to have a one-word imperative sentence: Stop!, Wait!,
    Look!, and even Don't. Those are the only one-word respon-
    ses that would count in DSS. The Developmental Sentence
    Types (DST) chart shows how to classify incomplete sen-
    tences, and many of these are one-word responses. You
    must see the book for further explanation, especially
    the chapter "Taking a Language Sample."

Appendix H Cont'd

11. A DSS on less that 50 sentences is tentative because
     the norms are based on 50. We did a 2 year old group
     derived a DSS on whatever number of sentences they gave,
     but these scores are somewhat doubtful. See Dr.
     Koenigsknecht's chapter on statistical information in
     my book.

Appendix I: Scored Examples of DSS for Representational-Imaginative and Personal Tasks for Both Age Groups

1. Representational-Imaginative Task: Five Year Old

	Indefinite Pronoun	Personal Pronoun	Main Verb	Secondary Verb	Negative	Conjunction	Interrogative Reversal	Wh-Question	Sentence Point	TOTAL
One of his airplanes crashed. And its broken. So he's crying.	3,1	2,2	2,1,1			3,5			1	21
(And) he had to make another one.	3,3	2	2	5					1	16
He have a new one.	3	2	*						0	5
He'll be happy.		2	4						1	7
He flied it and he broke it.	1,1	2,2	*2			3			0	11
Their dog's sick.		3	1						1	5
Once we had a green car, a Volvo.		3	2						1	6
It's broken. So we got a new Mazda.	1	3	1,2			5			1	13
The dog got sick so they are helping him to get not sick.		3,2	2,2	5		5			1	20
He'll be alive again.		2	4						1	7
They'll be happy again.		3	4						1	8
I forget all of it.	1,3	1	1						1	7
(Ah) the dad's try to help it.	1	1	5						1	8

Representational-Imaginative
Task: Five Year Old, Cont'd

	Indefinite Pronoun	Personal Pronoun	Main Verb	Secondary Verb	Negative	Conjunction	Interro-gative Reversal	Wh-Question	Sentence Point	TOTAL
They're playing football. And he is getting sick.		3,2	2,1			3			1	12
The teacher will call an ambulance			4						1	5
They go to the hospital.		3	1						1	5
(And) that other guy's trying to help him.	1,3	2	1	5					1	13
The guy with the crutch/I think he has some wooden shoes.	3	1,2	1,2			3			0	9
Yuh, and he kicked him.		2,2	2						1	10
He went around again, And he forgot to say sorry.		2,2	2,2	5		3			1	17
2. Personal Task: Five Year Old										
I don't get mad any more.	7,3	1	4						1	16
When kids hurt me then I get real mad sometimes he breaks my toys or something like that.	3,1	1,1, 2,1	1,1, 2			8,3, 5,8			0	37
That makes me mad and you know what?	1	1,1, 6	2,1			3	0		1	16

Personal Task: Five Year Old Cont'd	Indefinite Pronoun	Personal Pronoun	Main Verb	Secondary Verb	Negative	Conjunction	Interro-gative Reversal	Wh-Question	Sentence Point	TOTAL
Somebody broke Chris' rifle about this big and it was Rachel.	3,1 1		2,2			3			1	13
Rachel broke it and that's worth a lot of money.	1,1		2,1						1	6
(When) somebody lets me pet their dog and you know what?	3	1,3, 1,6	2,1	5		3	0		1	26
I really like this.	1	1	1						1	4
At our old house somebody's dog lived next door named Jenny Dog and she's a real nice dog.	3	3,2	2,1	4		3			0	18
(And) we say "sit and beg" and she sits.		3,2	1,1, 1,2			3,3			1	17
(And) she begs.		2	2						1	5
Sometimes I make things out of blocks.		1	1						1	3
Some kid kicks them down.	3	3	2						1	9
That makes me real furious.	1	1	2						0	4
Somebody did it on Wednesday.	3,1		2						1	7

Personal Task: Five Year Old Cont'd

	Indefinite Pronoun	Personal Pronoun	Main Verb	Secondary Verb	Negative	Conjunction	Interrogative Reversal	Wh-Question	Sentence Point	TOTAL
Was that a long time ago?	1		2						1	5
Let me think of one time when I felt happy.	3	1,1	1,2	5		8			1	22
I can't think of times when I've been happy but I'll try to remember.		1,1,1	4,7,4	5	4	8,5			1	41
When kids help me do something that makes me happy and when kids help me make something that makes me happy.	1,3,1	1,1,1,1	1,2,1,2	5,5		8,3,8			1	45
(And) when kids don't bother me that makes me happy too.	1	1,1	4,2		4	8			1	22
I think that's all I can remember.	1,3	1,1	1,1,4						1	13

3. Representational-Imaginative Task: Seven Year Old

	Indefinite Pronoun	Personal Pronoun	Main Verb	Secondary Verb	Negative	Conjunction	Interrogative Reversal	Wh-Question	Sentence Point	TOTAL
They're fighting and he's pulling his hair because I don't know how it started.	1	3,2,2	2,1,4,2		4	3,6,8			1	40

Representational-Imaginative Task: Seven Year Old, Cont'd	Indefinite Pronoun	Personal Pronoun	Main Verb	Secondary Verb	Negative	Conjunction	Interrogative Reversals	Wh-Question	Sentence Point	TOTAL
He might have tripped and stepped on his foot and then he started beating him up.	2,2, 2,2	8,8, 2	8			3,3			1	41
They'll stop fighting.		3	4	8					1	16
I donno.		1	4	4					1	10
They start crying.		3	1	8					1	13
Then they go home.		3	1						1	5
Then they tell their moms and that's all.	1,3	3,3	1,1			3			1	16
They're patting their dog and they're holding it.	1	3,3, 3	2,2			3			1	18
(And) she's looking at the dog a and he's laughing.		2,2	1,1			3			1	10
Then they're gonna get out and go in the shopping centre or something.	3	3	2	2,2		3,5			1	21
They go shopping and get presents.		3	1,1	8		3			1	17
(And) that's all.	1,3		1						1	6

Representational-Imaginative Task: Seven Year Old, Cont'd

	Indefinite Pronoun	Personal Pronoun	Main Verb	Secondary Verb	Negative	Conjunc-tion	Interro-gative Reversal	Wh-Question	Sentence Point	TOTAL
It's winter time and they mighta got stuck.	1	3	1,*	*		3			0	8
His plane crashed and so he started to cry.		2,2	2,2	5		5			1	19
(And) then he went probably home and he asked his mother to buy him a new one.	3	2,2, 2,2	2,2	5		3			0	23
She said, "no".		2	2						1	5
Then he went to bed and cried 'til his Dad came home and he bought him one.	3	2,2, 2,2	2,2, 2,2			3,8, 3			1	34
(And) then he went home and played with it again.	1	2	2,2	3		3			1	11
They're going to go somewhere.		3	2	3					1	9

4. Personal Task: Seven Year Old

	Indefinite Pronoun	Personal Pronoun	Main Verb	Secondary Verb	Negative	Conjunc-tion	Interro-gative Reversal	Wh-Question	Sentence Point	TOTAL
Once when I was building a house out of Leggo my brother came behind me and wrecked it.	1	1,1, 1	2,2, 2			8,3			1	22
(And) I blew my top.		1,1	2						1	5

Personal Task: Seven Year Old Cont'd	Indefinite Pronoun	Personal Pronoun	Main Verb	Secondary Verb	Negative	Conjunction	Interrogative Reversal	Wh-Question	Sentence Point	TOTAL
I punched him in the stomach accidentally.		1,2	2						1	6
(And) he told my mom and my mom gave me a scolding.		2,1,1,1	2,2	8		3			1	21
(And) another one was when I was building this house out of wood.	3,3,1	1	2,2	8		8			1	21
One time when I was happy, my brother came along and he said, "I'm sorry about hurting you before".	3	1,1,2,1,1	2,2,2,2	8		8,3			1	37
(And) once when I was playing with my friend I made a new friend and once when I was doing something this boy came along.	3,1	1,1,1,1	2,2,2,2			8,3,8			1	36
(And) he helped me and I had a new friend with him.		2,1,1,2	2,2	5		3			1	14
Once when I was four (one of) my brother came along and said "Would you like to meet my new friend? Okay." and I said yes.	3	1,1,1,1,1	2,2,2,6,2	5		8,3,3	6		1	48
(And) he helped me and I made a new friend with him.	1,3	2,2	2,2			3			1	16

Personal Task: Seven Year Old Cont'd	Indefinite Pronoun	Personal Pronoun	Main Verb	Secondary Verb	Negative	Conjunc-tion	Interro-gative Reversal	Wh-Question	Sentence Point	TOTAL
One time when I felt like that was when I had to go to my cou-sin's and I lost one of my pins 'cuz I was playing.	3,1, 3	1,1, 1,1, 1,1	2,2, 2,2, 2.	5		8,8, 8,3, 6			1	62
I lost my dime when I was going to the store and my brother saw me.		1,1, 1,1, 1	2,2, 2			8,3			1	23
(And) he got this big rock and he dropped it on.	1,1	2,2	2,2			3			1	14
(And) he smashed it in two and that's all.	1,3, 1,3	2	2,1						1	14
(And) once when we went to our cousin's I was trying to make this little pan out of clay and my brother smashed it.	1,1	3,3, 1	2,2, 2	5		8,3			1	32
(When) I went to the cousin's and we stayed up til 12 o'clock.	3	1,3	2,2			3,8			1	23
(And) (time) when we were home it was 2 o'clock and my brother and me were really tired.	1,3	3,1, *	2,2, 2			8,3, 3			0	28

Personal Task: Seven Year Old Cont'd	Indefinite Pronoun	Personal Pronoun	Main Verb	Secondary Verb	Negative	Conjunc-tion	Interro-gative Reversal	Wh-Question	Sentence Point	TOTAL
(And) I was too and I went but I wasn't that much tired.	1, *	1,1,1	2,2,2		7	3,5			0	25
(And) then I got tired again and I stayed up 'til 3 o'clock.	3	1,1	2,2			3,8			1	21
(And) I went to bed.		1	2						1	4

Appendix J: Representational-Imaginative and Personal
Language Samples of One Child Excluded from the Study (DSS)

1. Personal Task:

	Indefinite Pronoun	Personal Pronoun	Main Verb	Secondary Verb	Negative	Conjunction	Interro-gative Reversal	Wh-question	Sentence Point	TOTAL
It bleed.	1		*						0	1
That's all.	1,3		1						0	5
I hurt myself.		1,5	1						1	8
I would cry.		1	6						1	8
I never be bad.		1	*						0	1
I ride my bike.		1,1	1						1	4
I eat it.	1	1	1						1	4
I donno.		1	4		4				1	10
I play with toys.		1	1						1	3
He's snoring.		2	1						1	4
Hurt myself.										
Play.										
Ride around the park.										
At home.										

Personal Task Cont'd	Indefinite Pronoun	Personal Pronoun	Main Verb	Secondary Verb	Negative	Conjunction	Interrogative Reversal	Wh-Question	Sentence Point	TOTAL
Toys.										
Nothing.										
Biting on the collar.										
In the night.										
Read books.										
Go to bed.										
2. Representational-Imaginative Task										
They're fighting.		3	2						1	6
The people come.			1						1	2
They're sticked on.		3	2	*					0	5
One girl broke a leg.	3		2						1	6
People come.			1						1	2
He broke his airplane.		2,2	1						1	6
He cried.		2	2						1	5

Representational-Imaginative Task Cont'd	Indefinite Pronoun	Personal Pronoun	Main Verb	Secondary Verb	Negative	Conjunction	Interrogative Reversal	Wh-Question	Sentence Point	TOTAL
He went home.		2	2						1	5
It crashed.	1		2						1	4
His plane broke.		2	2						1	5
His 'nother plane broke.	*	2	2						0	4
His other that broke.	3,1	2	2						0	8
Front broke.			2						1	3
They went in a bus.		3	2						1	6
They got boots on.		3	*						0	3
Her got shoes on.		*	*						0	0
That's a dog.	1		1						1	3
He have a head.		2	*						0	2
He have a chain.		2	*						0	2

Appendix K

Language Programs Cited in Discussion

Special Programs

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